Focus Report

for the

Proposed Highway 113

Class I Environmental Assessment

March 2006

NOVA SCOTIA

Transportation and
Public Works

106-04929/

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1. INTRODUCTION

The Department of Transportation and Public Works (TPW) expects that traffic will continue to grow on major arterial routes, primarily Highway 102, Highway 103 and Hammonds Plains Road, and that eventually another road would be required to keep these existing roads operating at acceptable safety and service levels.

While construction is not anticipated to happen for many years, early planning for the highway is important as this area of HRM is developing quickly and possible routes for a new road are very limited. The majority of the proposed highway alignment crosses private land and generally skirts existing development. Without corridor preservation the majority of land required for the highway could be privately developed. The expected result would be either the elimination of any options for the highway alignment or a highway project that has higher construction costs, and causes greater impacts on existing development and the environment. Some property has been purchased in order to preserve a corridor for the highway where imminent development would have prevented preservation of the land.

Corridor preservation work for the proposed Highway 113 began in 1998. In May 2001 the project was registered under the Nova Scotia Environmental Assessment (EA) process as part of TPW's corridor preservation process. That registration included Addendum No. 1, as TPW provided information additional to the EA report as part of the original submission. At that time, Nova Scotia Environment and Labour (NSEL) determined more information was needed to make a decision about the project. This additional information was submitted in September 2004, as Addendum No. 2.

In October 2004, TPW withdrew the project from the process in order to redefine the project by removing the connector road (Addendum No.3). The connecter road will eventually provide access to the highway for residents of the Timberlea, Hubley and Five Island Lake areas and was included in the original project description. It is also a primary road through the Sheldrake Heights subdivision and it was removed from the project description to enable the development of the subdivision to continue. The project was re-registered in October 2004.

In November 2004, the Minister of NSEL decided that there may be limited adverse effects or significant environmental effects related to the proposal and directed TPW to prepare a focus report to examine how the proposed Highway 113 fits with the Halifax Regional Municipality's (HRM's) Regional Municipality Planning Strategy (the Plan). This submission is in response to the focus report requirement and is organized to follow the terms of reference. The Regional Plan is not yet approved and references to the Plan in this report are to the Draft 2, November 30, 2005 version of the Plan (HRM 2005a).

Two reports, commissioned to assist in preparing this focus report, are attached as appendices. Appendix A is a Demand and Strategic Context Focus Study which was commissioned by TPW and prepared by Delphi-MRC. Appendix B is the Blue Mountain/Birch Cove Assessment Study prepared by EDM Limited. The EDM study was led by HRM with TPW and DNR staff participating on the steering committee. The report is an initial stage in the discussions that will be required to ensure an integrated approach to future highway development, natural resource management and park planning and development. The report has not been presented to HRM Council.

2. PROJECT DESCRIPTION

Highway Location

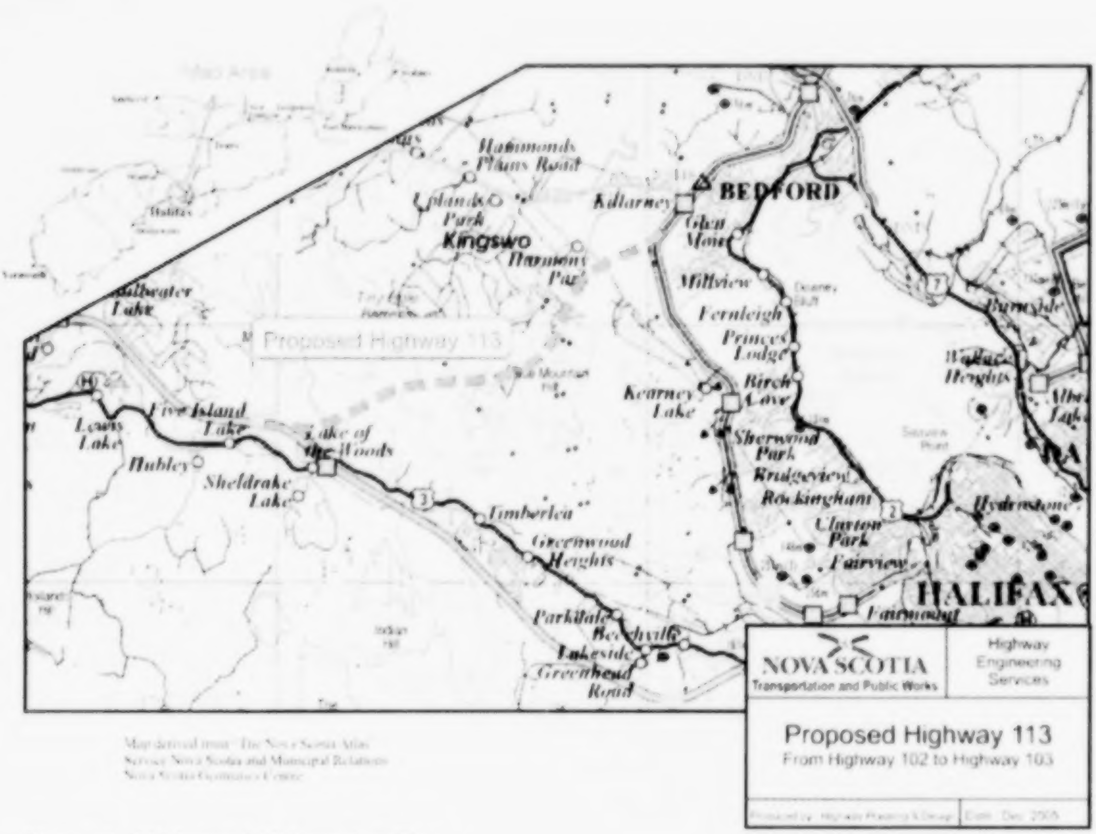
Highway 113 is proposed as a 100 series highway that connects Highways 102 and 103 and bypasses congested sections of these highways that access the Halifax urban core as well as the alternative route, Hammonds Plains Road (Route 213). The proposed alignment connects to Highway 103 just north of Exit 4 at Sheldrake Lake and continues east between Maple and Frasers Lakes and skirts the southern edge of the Kingswood subdivision. It crosses and connects to Kearney Lake Road with a diamond interchange and continues east to connect to Highway 102 near Exit 3, (Hammonds Plains Road). The right-of-way to be reserved for the highway is 150 metres wide (see Figure 1).

Highway Length

The proposed highway length has been estimated as 9.9 km. The estimate was based on digital topographic mapping and calculated using computer software. Estimating the distance from the midpoint between the lanes where Highway113 diverges from Highway 102 to the midpoint between the lanes where Highway 113 would merge with Highway 103, the length of the project to two decimal places is 9.84 km. Consistent with typical practice, only the main through lanes are included in the distance estimate. The distance is measured horizontally along the proposed curvilinear alignment. It is not a straight line distance measurement between the points of intersection with Highways 102 and 103.

Underlying Project Assumptions

Highway 113 is proposed to be a 100 series, controlled access, high speed, 4-lane 27.6 metre wide depressed median highway with directional ramp connections to Highways 102 and 103 at either end. A fully directional connection to Highway 102 is not required with the proximity of the proposed Kearney Lake Road diamond interchange. At the western end, the access to Highway 113 for the residents of Timberlea, Hubley and Five Island Lake areas, is by means of a connector road from Trunk 3 to a half diamond interchange on Highway 113. The half diamond and connector arrangement affects less land and does not directly impact existing residences. To provide an interchange at Highway 103 and Highway 113 would be difficult, if not impossible to build given the proximity of Upper Sheldrake and Sheldrake Lakes, Sheldrake Lake sub-division and the existing Highway 103 Exit 4 interchange. Even if it was possible to build, provision for these two movements would be very expensive and underutilized as they would serve a relatively small residential area that can have access via the connector. Only one additional interchange will be considered for future addition to the highway if requested by HRM for service to the existing Kingswood sub-division and/or a regional park.


Hammonds Plains Road
Uplands Park
Kingswood
Hammonds Plains
Killarney
BEDFORD
Glen Moir
Millview
Fernleigh
Princes Lodge
Birch Cove
Kearney Lake
Sherwood Park
Bridgeview
Rockingham
Clayton Park
Fairview
Fairmount
HALIFAX
Hydrostone
Wallace Heights
Burnside
Stillwater Lake
Proposed Highway 113
Lewis Lake
Five Island Lake
Lake of the Woods
Hubley
Sheldrake Lake
Timberlea
Greenwood Heights
Parkdale
Beechville
Lakeside
Greenhead Road
NOVA SCOTIA
Transportation and Public Works
Highway Engineering Services
Proposed Highway 113
From Highway 102 to Highway 103
Produced by: Highway Planning & Design
Date: Dec 2005

Map derived from "The Nova Scotia Atlas"
Service Nova Scotia and Municipal Relations
Nova Scotia Geomatics Centre

Figure 1 - Highway 113 Location Plan

The first steps in TPW's corridor preservation process include preparing functional designs based on topographic mapping and conducting a preliminary environmental screening. These steps are taken before the project is registered for a formal environmental assessment in an aim to register the most environmentally appropriate alignment. The preliminary environmental screening involves investigating up to 61 possible constraints and consultation with a number of government departments and agencies in order to identify known environmental features present in the study area. As well, a public consultation is normally conducted in advance of environmental registration. The public consultation for this project was held in July 1998. The corridor preservation process continues with obtaining formal environmental approval and producing a detailed design and concludes with purchasing the land required. It is TPW's practice to obtain environmental approval for a project before making significant property purchases.

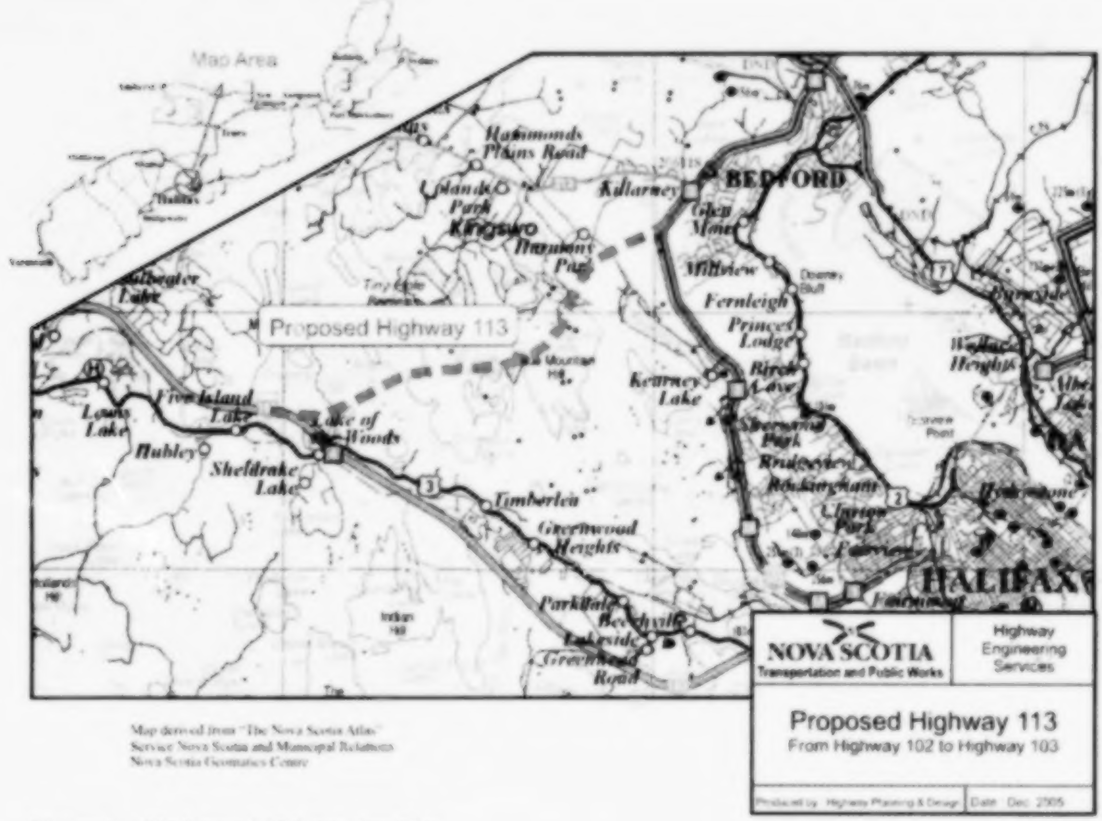

Map Area
Hammonds Plains Road
Uplands Park
Kingswood
Killarney
BEDFORD
Millview
Fernleigh
Princes Lodge
Birch Cove
Kearney Lake
Wallace Heights
Proposed Highway 113
Five Island Lake
Lake of Woods
Hubley
Sheldrake Lake
Timberlea
Greenwood Heights
Parkdale
Beechville
Lakeside
Greenwood Road
Rockingham
Clayton Park
HALIFAX
Fairmount
NOVA SCOTIA
Transportation and Public Works
Highway Engineering Services
Proposed Highway 113
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Figure 1 - Highway 113 Location Plan

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Constraints and goals considered in the functional design/corridor preservation process include the following.

- The alignment was kept as far north as possible to minimize the intrusion into the undeveloped crown land block and for this reason the alignment generally skirts the southern edge of the Kingswood subdivision. At the time the alignment was identified, residential development had not occurred south of Ragged Lake. Ragged Lake was a constraint in locating the highway and development has since filled in between the proposed highway right-of-way and Ragged Lake.

- A balance of separation distances was necessary for siting the highway between Blue Mountain Hill and Ragged Lake. To go south of Blue Mountain Hill would have meant greater intrusion into the crown land block. Blue Mountain Hill has scenic look-off value that TPW recognizes as important. The hill will not be used as a source of aggregate for highway construction. Other nearby, commercial sources are readily available for highway construction.

- The highway design was modified in the initial project stages to minimize wetland impacts. It is standard TPW practice to minimize wetland impacts and to mitigate any unavoidable impacts by restoring, creating or enhancing other wetlands. The original environmental study (AMEC, 2000) concluded that with appropriate design and construction measures no significant residual adverse effects are likely to the hydrology of the wetlands.

- As part of the design process, DNR will be consulted on the need for, location and design of any wildlife crossings. The Environmental Assessment work to date (AMEC, 2004) found that the project area does not include any important moose habitat. This study, conducted in partnership with the Department of Natural Resources (DNR), concluded that while moose may be found occasionally in the area, there is no significant habitat that will be affected by the highway. Further study of the moose population is underway. It is examining the presence and migration patterns so that required wildlife passages can be properly located and designed. The data on the moose will be collected and requirements for crossings determined with DNR prior to the design of any crossings. HRM will be consulted on the location and design of pedestrian crossings in the context of the potential regional park and connectivity to active transportation links. Likewise, Navigable Waters regulations will be followed and local interest groups will be consulted on portage requirements.

- The final detailed design of the highway will reflect its location adjacent to the potential future regional park and context sensitive design principles will be applied. The design of highway crossings will reflect Crime Prevention Through Environmental Design (CPTED) principles.

- Highway 113 is a corridor preservation project at this time. Construction will be contemplated only when the need for the highway is clearly demonstrated and the significant expenditure warranted.

Construction Schedule

The project is not currently scheduled and no funding has been allotted for construction. Highway 113 is a corridor preservation project at this time. TPW anticipates that traffic will continue to grow on regional arterial roads, including Highways 102 and 103 and the Hammonds Plains Road, and that eventually another road will be required to maintain acceptable levels of safety and service on these existing roads.

Highway 113 has been identified as a future transportation route in HRM's Regional Plan. As a future route it is expected to be required beyond the 2026 Plan horizon year. This is consistent with TPW's expectations for the timing of the need for the highway. These expectations are based on the transportation demand management measures, such as providing for increased transit use, which form part of the Plan. The Department's position is that Highway 113 will not be constructed before the need is present. It is difficult to estimate when the highway will be required but it is not expected to be for many years.

HRM has identified other priorities for provincial infrastructure funding including Highway 107 (Burnside to Highway 102) and an additional Highway 101 interchange in Upper Sackville that they foresee will be required within the time frame of the Regional Plan. Highway 113 is among a list of five Future Potential projects identified in the Plan. Also on the list is the Beaver Bank Bypass, a municipal road that HRM has identified as a Future Potential project. Although it is not expected to be required within the Regional Plan horizon, they are actively preserving the corridor now.

TPW is presently working to preserve the right-of-way for the Highway 113 project. Early planning for this road is important as the area is developing quickly and possible routes for the new road are very limited. The proposed alignment primarily passes through private land and generally skirts existing development. Without corridor preservation a majority of the alignment could be privately developed making future construction very disruptive and considerably more expensive.

Ultimately the timing of construction will depend on how quickly traffic volumes grow, the availability of funding, and the project's priority among other government projects at the time the highway is required. The project will be scheduled in consultation with HRM through the Strategic Joint Regional Transportation Planning committee that is to be established as part of the Regional Plan.

3. REASON FOR THE UNDERTAKING

TPW anticipates that traffic will continue to grow on the region's arterial roads, including Highways 102 and 103 and Hammonds Plains Road, and that eventually another route will be required to maintain acceptable levels of service and safety performance. Highway 113 is proposed to address this expected need. It connects Highways 102 and 103 and bypasses the busier sections of these highways providing access to the Halifax urban core as well as the alternative route, Hammonds Plains Road. Highway 113 would attract traffic from these and other busy commuter routes thus improving their levels of service and safety.

Traffic has been growing on Highways 102 and 103 at fairly significant rates. As noted in the report in Appendix A, the regional average growth rate on the major HRM highways is just over 5% annually. Even assuming more moderate increases in the future, it is reasonable to expect that at some point additional highway capacity will be needed.

To gain a better understanding of the traffic component of the project, TPW commissioned Delphi-MRC to undertake a study titled *Highway 113: A Demand and Strategic Context Focus Study*. The report concludes that there is a significant level of demand for a high-speed corridor linking Highway 102 and Highway 103 based on traffic modelling for the year 2026. A copy of the report is included as Appendix A. The updated modelling also provided additional insight into where the demand for Highway 113 is coming from through the use of Select Link Analyses. The model results show that 50 percent of the traffic using Highway 113 southbound originates in the Bedford/Sackville area and 42 percent originates in the Dartmouth area. The model also indicates that Highway 113 is a very attractive alternative route to the Hammonds Plains Road or the Highway 102/103 corridor.

The traffic modelling was based on a number of conservative assumptions. It did not include external to external trips (i.e. vehicles travelling through the study area). In addition, the traffic model assumed a relatively conservative traffic growth rate of one percent. An interchange connection with the Kingswood sub-division was not included in the model and the model did not include the planned Highway 107 link from Burnside to Highway 102.

Even without the inclusion of the Highway 107 link, the model indicated that Highway 113 was drawing traffic around the harbour. Figure 10 in Appendix A illustrates the modelled demand for Highway 113. The volume reduction on Highway 103 appears to represent a demand for Highway 113 that originates on the Dartmouth side of the harbour and that uses Highway 113 instead of the harbour bridges and Highway 103. This attraction is assumed to be even greater if Highway 107 is present at the time Highway 113 is built. With the future Highway107 connection, Highway 113 completes a circumferential highway system connecting Burnside, Bedford, Sackville and Hammonds Plains. HRM's Plan indicates that the Highway 107 connection is required before Highway 113.

The modelling shows that Highway 113 provides traffic relief to Hammonds Plains Road. Hammonds Plains Road, in addition to serving a large residential base, provides a more direct route from Highway 102 to Highway 103 for through car traffic. Trucks are prohibited from using the Hammonds Plains Road although there is still a substantial percentage of trucks using Hammonds Plains Road as discussed in the Delphi-MRC study in Appendix A. The current traffic pressures on Hammonds Plains Road are addressed in the Regional Plan, which proposes to curtail further significant residential activity in the area until a change in infrastructure capacity is provided. The only way to increase capacity is to build a new highway or add lanes to an existing one. HRM is not considering widening Hammonds Plains Road to provide additional capacity but will be making transit improvements that, together with the development restrictions, are expected to ease traffic pressures. Highway 113 is identified in the Plan as a potential future highway indicating that it will likely be required some time beyond 2026.

Highway 113 provides a truck route that bypasses sections of Highways 102 and 103. The Highway 113: Demand and Strategic Context Focus Study, Appendix A, notes that providing Highway 113 as a truck route could likely attract through-trucking trips and would allow Highway 102 to operate as a commuter freeway servicing the Halifax peninsula. It would likely improve short-term capacity constraints and more importantly it would reduce safety risks associated with larger vehicles.

The need for Highway 113 has been discussed and primarily considered on a regional basis. It is important to note that Highway 113 also provides a route for provincial traffic wishing to bypass the busier sections of Highways 102 and 103 that access the Halifax urban core. This traffic was not expected to be a significant component of the total traffic and so it was not included in the model. Nonetheless, it is a role of the highway to be considered.

Given that Highway 113 is not anticipated to be constructed until near, or past, the end of the Regional Plan time frame, the transportation demand management measures identified in the Plan will have the opportunity to be implemented and established before the Highway is part of the network. Transit improvements are expected to delay the need for the highway but eventually Highway 113 will be required to support regional and provincial mobility and promote a vigourous economy.

4. OTHER METHODS/ALTERNATIVES FOR CARRYING OUT THE UNDERTAKING

The description for the other methods of carrying out the undertaking, in section 4 of the original environmental assessment report (AMEC, 2000) is confirmed.

Alternative Routes

An alternative alignment south of the proposed alignment would provide many of the same benefits as the proposed alignment but it would cross the area currently proposed as a regional park rather than follow the northern boundary of it. It would also potentially impact the many lakes present in the area. The currently proposed alignment was selected in response to the existing development and known environmental constraints. Although there is some room for minor adjustment in certain areas within the corridor presented, there are many constraints (lakes, wetlands, hills, opportunities for connection to Highways 103 and 102, existing development) that greatly limit the actual route.

Other routes would displace existing residential development. A bypass road north of Hammonds Plains Road has essentially been eliminated by development. Locating Highway 113 farther north would likely result in the highway attracting less traffic from the other arterial roads that Highway 113, in its proposed location, is intended to serve.

Upgrading Hammonds Plains Road

To widen Hammonds Plains Road would cause significant property damage to homes and businesses. HRM is not currently considering upgrading Hammonds Plains Road. In similar situations, such as the Beaver Bank Road in Sackville, a bypass is usually less disruptive than upgrading. Building a road parallel to Hammonds Plains to provide property access in order to remove direct access to Hammonds Plains Road would also involve property impacts. A parallel access road is also a very costly alternative and HRM does not have plans to construct one. Providing a bypass for Hammonds Plains Road is one of the functions of the proposed Highway 113.

Do Nothing Alternative

Traffic and population have been growing steadily in the region and both are expected to continue to grow. At some point additional road infrastructure will be required to serve the mobility needs of people and goods. It is a reasonable assumption that eventually the highway will be required. In a growing area it is important that the planning for future transportation needs happens early. Waiting until the need arises could result in transportation projects that have greater property and environmental impacts and are significantly more expensive. Doing nothing at this time is not considered to be a responsible option given that the need is reasonably foreseen.

Median Width Options

Highway 113 is currently planned to be a 27.6 metre wide depressed median facility, similar to the design of Highway 103. The difference in overall width of the highway as compared to a barrier median cross-section is 22 metres. Depressed median facilities generally have a better safety performance than barrier median facilities. The recent Nova Scotia 5-year annual collision rate for barrier median 100 series highways is about twice the rate for 100 series depressed median highways. The potential decrease in width of the highway footprint in changing the design to a barrier median cross-section was not considered to offset the safety benefits.

Other Transportation Modes

Increased transit use is an important premise of HRM's Regional Plan. Highway 113 is not expected to limit the potential for increasing transit rider-ship as the highway is not anticipated to be constructed before the Plan is nearing the end of its time frame. Successful implementation of HRM's Plan may delay the need for the highway but eventually it is expected to be required even with increased public transit use. Highway 113 will serve longer commuter routes, trucking and provincial travel that cannot be adequately served by other modes but will provide another option for high-speed transit vehicles. Regardless, Highway 113 will not be built until it is needed. Should the modes of transportation change significantly in the future and the need for the highway never arise, it will not be built.

5. DESCRIPTION OF HRM'S REGIONAL PLANNING PROCESS

Scope

The Regional Plan is the realization of a major benefit of regional amalgamation.The Regional Municipal Planning Strategy (the Plan) has been developed as an overall framework to guide growth for the whole municipality applying integrated land use planning. The previous 18 Municipal Planning Strategies and 15 Secondary Planning Strategies, which address districts individually, will all become Secondary Planning Strategies. The objective is to plan development to protect the quality of life and distinctive characteristics that make HRM an attractive place to live.

The vision and principles that have guided the development of the Plan and were adopted by Regional Council are:

Vision

> HRM's vision for the future is one of healthy, vibrant and sustainable communities. HRM will adopt a Regional Plan which, throughout the next 25 years, will guide HRM's physical development to reach this goal.

Guiding Principle

> The Regional Plan will seek to address the needs and views of all sectors of HRM, recognizing the diversity of its citizens, community and geography.

Principles

> The Regional Plan:
>
> - Provides a framework that leads to predictable, fair, cost effective decision making;
> - Supports development patterns that promote a vigorous economy;
> - Preserves and promotes sustainability of cultural and historical assets;
> - Supports appropriate roles for the Halifax/Dartmouth central business district and local business districts as a focus for economic, cultural and residential activities;
> - Manages development to make the most effective use of land, energy, infrastructure, public services and facilities and considers healthy lifestyles;
> - Ensures opportunities for the protection of open space, wilderness, natural beauty and sensitive environmental areas; and
> - Develops integrated transportation systems in conjunction with the other principles.
>
> (HRM, 2005a)

Regional Planning Process

The two phase regional planning process, which began in November 2001, was led by the Regional Planning Committee made up of a group of citizens and Councillors. In the first phase, completed in December 2002, public consultation and development of background documents were used to help identify the themes of the Plan and guide the creation of the vision and principles. Within this research and information gathering phase, 18 studies were completed. These studies were:

- Land Use Opportunities for Sustainable Development;
- Rural Community Form and Land Use Suitability;
- Greenfield Areas Servicing Analysis;
- Brownfield Analysis;
- Urban Core Residential Capacity Analysis;
- Housing Projections Study;
- Municipal Land Use Policy & Housing Affordability Study;
- Cost of Servicing Analysis;
- Transit and Land Use Form;
- Transit Oriented Development (TOD) & High Capacity Transit (HCT)Opportunities Analysis;
- Transportation Demand Management Options;
- Parking Supply Management Strategies;
- Water Resource Management Study;
- Options for On-Site and Small Scale Wastewater Management;
- HRM Economic Potential;
- Capital District Urban Design Study;
- Cultural Heritage Protection; and
- Harbour Plan.

(HRM, 2004b)

During the second phase, the goals, objectives, activities and the Plan itself were developed. The second phase is still in progress. A first draft of the Plan was released publicly on May 10, 2005. Information presented here is derived from the second draft of the Plan, presented to the public on December 6, 2005 (HRM, 2005a).

Public Participation

Opportunities for public participation were diverse and were incorporated throughout the Plan development process. In Phase I a citizen's survey, community case studies, position papers, a workbook and a Capital District visioning process provided opportunities for public participation. In Phase II, described in 8 steps in Figure 2, opportunities for public participation have been provided during two steps. In Step 2, Develop Goals, Objectives & Opportunities, public input was sought on the objectives of the step. Step 4 was Public Consultation on the Alternatives (HRM, 2003).

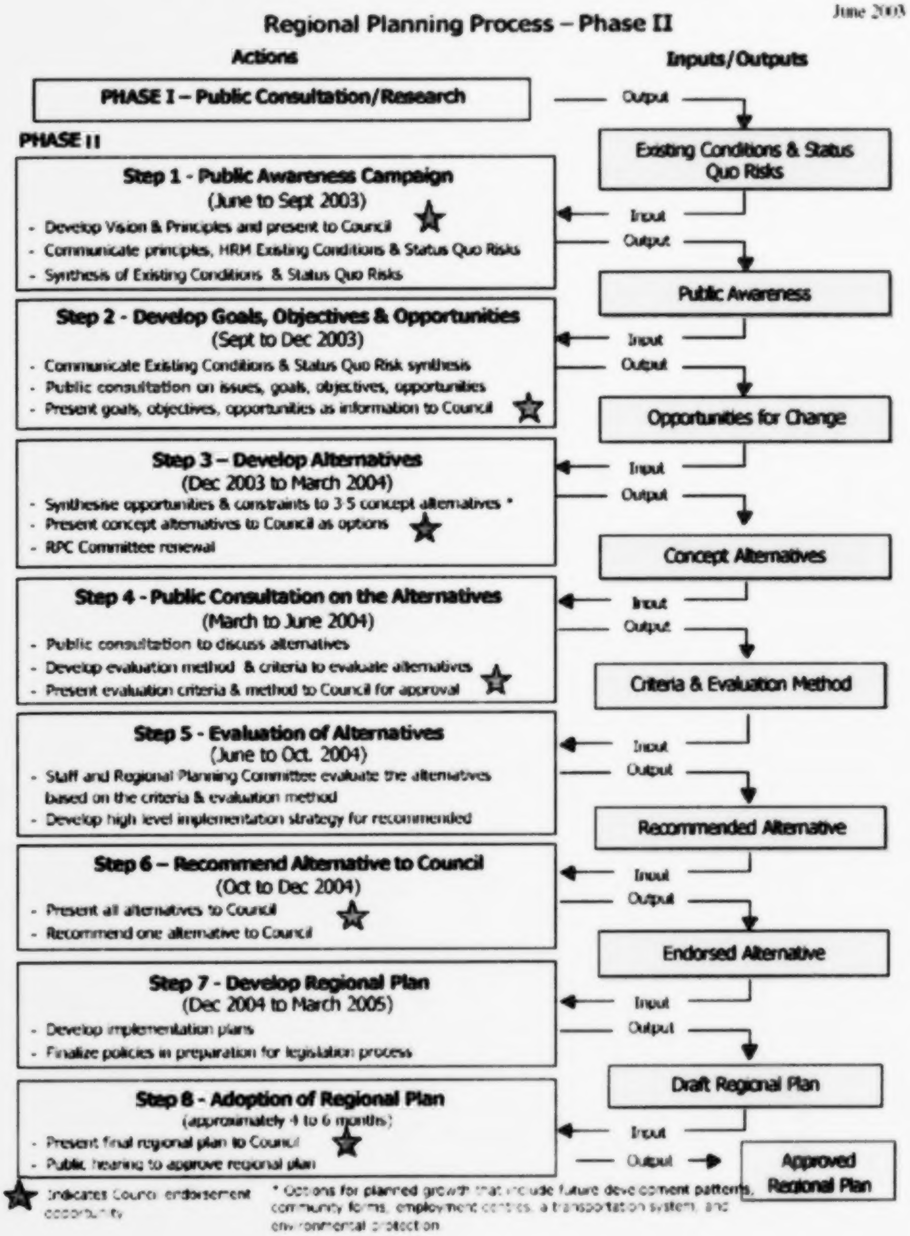
June 2003
Regional Planning Process – Phase II
Actions
Inputs/Outputs
PHASE I – Public Consultation/Research
Output
PHASE II
Existing Conditions & Status Quo Risks
Step 1 - Public Awareness Campaign
(June to Sept 2003)
- Develop Vision & Principles and present to Council
- Communicate principles, HRM Existing Conditions & Status Quo Risks
- Synthesis of Existing Conditions & Status Quo Risks
Input
Output
Public Awareness
Step 2 - Develop Goals, Objectives & Opportunities
(Sept to Dec 2003)
- Communicate Existing Conditions & Status Quo Risk synthesis
- Public consultation on issues, goals, objectives, opportunities
- Present goals, objectives, opportunities as information to Council
Input
Output
Opportunities for Change
Step 3 – Develop Alternatives
(Dec 2003 to March 2004)
- Synthesise opportunities & constraints to 3-5 concept alternatives *
- Present concept alternatives to Council as options
- RPC Committee renewal
Input
Output
Concept Alternatives
Step 4 - Public Consultation on the Alternatives
(March to June 2004)
- Public consultation to discuss alternatives
- Develop evaluation method & criteria to evaluate alternatives
- Present evaluation criteria & method to Council for approval
Input
Output
Criteria & Evaluation Method
Step 5 - Evaluation of Alternatives
(June to Oct. 2004)
- Staff and Regional Planning Committee evaluate the alternatives based on the criteria & evaluation method
- Develop high level implementation strategy for recommended
Input
Output
Recommended Alternative
Step 6 – Recommend Alternative to Council
(Oct to Dec 2004)
- Present all alternatives to Council
- Recommend one alternative to Council
Input
Output
Endorsed Alternative
Step 7 - Develop Regional Plan
(Dec 2004 to March 2005)
- Develop implementation plans
- Finalize policies in preparation for legislation process
Input
Output
Draft Regional Plan
Step 8 - Adoption of Regional Plan
(approximately 4 to 6 months)
- Present final regional plan to Council
- Public hearing to approve regional plan
Input
Output
Approved Regional Plan
★ Indicates Council endorsement opportunity
* Options for planned growth that include future development patterns, community forms, employment centres, a transportation system, and environmental protection

Figure 2 - Regional Planning Process (HRM, 2003)

Themes

The six themes of the Regional Plan are: economy, environment, settlement pattern, transportation, Halifax Harbour and the Capital District. HRM states that although each theme has an associated set of issues and opportunities, they are each dependent on the others for success of the Regional Plan.

Economy: "The regional plan will determine what locations are regionally significant to support economic expansions and the infrastructure needed to support these assets." (HRM, 2005b)

This theme addresses the importance of the Capital District commercial areas of Halifax and Dartmouth as well as suburban and rural centres.

Environment: "The Regional Plan will identify ways to protect HRM's environmental assets, as our region continues to grow." (HRM, 2005b)

Public participation identified the top five concerns during Phase I of the planning process as:
- Halifax Harbour clean-up;
- Drinking water quality;
- Lake water quality for recreation;
- Loss of wildlife habitat; and
- Conservation of green spaces.

To address this theme, the Plan will provide ways to preserve natural resources, recreation and cultural areas, and the connection of parks and forests to preserve wildlife.

Settlement Pattern & Community Form: "The Regional Plan will identify where HRM should encourage residential growth over the next 25 years." (HRM, 2005b)

The Plan seeks to provide opportunities for change, balancing lifestyle choices and an increase in the efficiency of development, to reduce the costs of infrastructure such as roads and other services.

Transportation: "The Regional Planning process will determine what type of transportation investment we need to match our growth and citizen's lifestyles." (HRM, 2005b)

Transportation has been considered a critical part of the Plan process because of its effects on access to employment, schools, shopping and recreation. The Plan recognizes that investment in the type of transportation will depend on where growth occurs and its form and where employment and resource centres are. The emphasis in the Plan is on the enhancement of transit and other means to reduce the numbers of car trips.

Halifax Harbour: "As a component of the Regional Plan, the Halifax Harbour Plan will address its future development, including all harbourfront lands and the water itself." (HRM, 2005b)

The harbour is a resource of regional and national importance. Careful management is required for often competing uses, which include: navy; marine and offshore industries; residential; tourism; and recreational uses. A Harbour Plan will be developed with mechanisms to balance the uses of the harbour using policy, regulation and communications between stakeholders.

Capital District: "This Plan provides policies in order that HRM, in cooperation with senior levels of government, citizens and stakeholders, can support and strengthen the critical economic function of the Capital District." (HRM, 2005b)

The Capital District includes the downtown areas of Dartmouth and Halifax, and surrounding commercial areas. Policies will be provided in the Plan to support economic functions, public infrastructure and new development to compliment the fabric of the District.

6. HIGHWAY 113WITHIN THE CONTEXT OF HRM'S REGIONAL PLAN

This section describes how the proposed Highway 113 fits within the context of HRM's Regional Plan. The Regional Plan as outlined above addresses six themes that each have specific issues and opportunities; however, there are links between these themes that make them interdependent. The Plan approaches to the themes of environment, settlement pattern & community form and transportation all have a bearing on the need for and function of Highway 113.

Transportation

Through the regional planning process HRM provides for the integration of land use and transportation planning. Traffic demand will be managed through various measures, including: encouraging more use of transit; encouraging car and van pooling; investments in the road network; improvements in transit service levels and increases in ridership; encouraging alternative modes of transportation, which will include active transportation; and increased use of ferry services in Halifax Harbour. The importance of the continued use of the automobile is recognized, while enabling and encouraging the use of alternatives.

The integration of transportation with land use planning will perhaps be best achieved by promoting settlement patterns that integrate transit and pedestrian oriented mixed land use centres. An important land use strategy that will likely have the effect of controlling the rate of increase in traffic volumes is the maximization of new development in areas that are already serviced while managing growth in unserviced areas.

Corridor Preservation

Investment in the road network is addressed with the identification of road construction projects and priorities. To enable potential construction of new roadways, the Plan provides the following discussion of transportation corridors:

> An efficient and effective transportation system depends upon preserving corridors for future transportation projects. Transportation corridors are wide, linear areas to provide important connections between communities and modes of transportation, for passengers, goods and services.
>
> There are many benefits of transportation corridor planning. These include:
> 1. resolving major planning issues prior to the beginning of a development project;
> 2. providing a framework within which individual projects can be reviewed and prioritized;
> 3. preserving transportation corridors within new communities which help to reduce overall development and infrastructure costs, uncertainty about where corridors will be needed in the future and social and economic impacts; and
> 4. the protection of investments in the transportation network.

> To maintain the system, as well as to accommodate alternative means of transportation within existing corridors, it is essential to identify and retain corridors significant to the integrity of the transportation network and to identify and define the function of each type of road or facility.
>
> (HRM, 2005a, p. 67)

The Plan identifies road construction projects that may still be needed for efficient growth of HRM, even if directed growth reduces the need to build roads and other travel demand management methods are successful. The projects are identified in the categories of programmed, planned and future potential. The latter are expected to be constructed beyond the 25 year horizon of the Plan.

Four projects that would be provincial responsibility are identified. The two Planned Projects are the Highway 107 extension that would connect Akerley Boulevard to Highways 101 and 102, and the Highway 101 connector and interchange. Highway 113 and the Highway 107 Cherrybrook by-pass are identified as Future Potential Projects (HRM, 2005a, p.69).

The Plan provides policy to establish a Transportation Reserve Zone for portions of corridors it plans to acquire. However, the zoning will only be applied for 5 years following adoption of the Plan (HRM, 2005a, p. 69).

The Plan identifies the need to place limitations on subdivision of land for residential development where the roadway network cannot safely accommodate additional demand created by the development. Hammonds Plains and Beaver Bank are identified as areas where this condition already exists. The Plan includes a policy to allow such limitations based on the opinion of the Traffic Authority (HRM, 2005a, p. 70).

Public comments provided to HRM during the review of the Plan suggested that the identified future potential corridor for Highway 113 be removed. The following was provided in response:

> The plan provides only for the setting aside of a Highway 113 roadway corridor, not for construction of a roadway. Whether or not the roadway gets built is ultimately a decision for the Province as it forms part of their provincial highway system. Nevertheless, the traffic modelling undertaken for the Regional Plan has indicated some future traffic management value to this corridor and so the municipality is working jointly with the province on procurement of a corridor and mitigation of impacts to the adjacent open space lands.
>
> The settlement pattern set forth in the Plan strives to delay construction of major roadways such as this one. Although roadway capacity demands will be reduced with transit initiatives, the Plan recognizes capacity issues will eventually become acute on Hammonds Plains Road and Highway 102, two roadway sections that will experience traffic reductions once Highway 113 is operational.

> The plan indicates Hammonds Plains Road and Beaver Bank Road are at their traffic volume thresholds and prescribes growth controls to keep traffic loading from worsening. It is recognized, however, a position like that is not supportable unless we can say a solution to resolve the issue is available, even if we argue that, if not currently affordable to the municipality. In the case of Hammonds Plains Road, we are aware of no realistic solution to the traffic loading situation on Hammonds Plains Road other than Highway 113. If a future road corridor is not preserved, all practical options for opening lands along Hammonds Plains Road for development will be lost forever.
>
> (HRM, 2006, pp. 14, 15)

On this basis no change in the Draft 2 Plan was recommended.

Transportation Master Plan
To implement the transportation aspects of the Plan, HRM intends to develop a Transportation Master Plan that will include five functional plans: Road and Road Network; Public Transit; Active Transportation; Transportation Demand Management; and Regional Parking Strategy. These will be developed with the goals of improving traffic movements, reducing single occupant passenger vehicle travel; and shifting to other modes of transportation. Existing components, such as the Metro Transit Strategy will be referenced by the Transportation Master Plan. The Master Plan will be administered by a Strategic Joint Regional Transportation Planning Committee (the Committee).

While land use planning and development issues are mostly the responsibility of HRM, transportation is a responsibility shared with the Province. As a result of discussions between HRM and the Province, key regional transportation stakeholders have been identified and have been included in the Committee. The Committee is expected to be effective in coordinating transportation network management and settlement patterns. Through the Committee, HRM intends to set the priorities for roadway projects and integrate settlement patterns, environmental concerns and transportation planning. TPW will be an active participant in the Committee.

Consistency of Highway 113 with the Plan
Immediate construction of Highway 113 would be inconsistent with the Plan as well as with TPW policy. If Highway 113 were built before traffic demand is sufficient it could undermine both the transportation policies and settlement and housing policies of the Plan, and through induced traffic use might reduce the rate of mode shift from automobiles to other forms of transportation. TPW does not intend to build Highway 113 until the demand justifies its construction, and therefore, it is not inconsistent with the Plan.

TPW has proposed the construction of Highway 113 and submitted it as an undertaking under the *Environmental Assessment Regulations* in order to establish and protect the right-of-way for the time until the Highway is needed.

If the Highway alignment had not been identified for corridor protection in 1998, the ongoing plans for Bedford West would not include the preservation of the corridor through the area and remaining alternatives for a Highway 113 alignment would be severely limited or impossible to obtain.

As demonstrated by the attached study (Appendix A) and consistent with HRM's Plan, Highway 113 will be needed at some point, which may be beyond the 25 year Plan period. With new evaluations by the Committee or during the required 5 year reviews of the Plan it may be determined that Highway 113 or portions of it are needed in a shorter time than 25 or more years.

Highway 113 is consistent with the Plan in that it is identified as a Future Potential Project. Once built, Highwayl13 would be consistent with the Transportation goals of the Plan to improve traffic flows and enhance traffic safety.

Private Development

Private development is addressed in the Plan under the heading of Settlement & Housing. The Plan identifies the need to manage growth to avoid risks to the natural environment, to communities and the quality of life. The Plan also seeks to limit extensive expenditures in infrastructure to support new growth. The target balance of growth is 25% in peninsular Halifax and in Dartmouth inside the circumferential highway, 50% in suburban areas and 25% in the rural areas.

The Plan locates centres for growth in areas where services can be provided economically. These services include transit, water and sewer services. The general land use designations are: urban setttlement; urban reserve; rural commuter; rural resource; and agricultural.

The Regional Plan identifies a Rural Commuter Designation intended for low to medium-density uses in defined centres. These would be in easy commuting distance to the Regional Centre (HRM, 2005, p. 45).

The Rural Commuter land use designation applies to existing residential and other land uses that have been developed adjacent to 100 series highways, for example areas of Hubley and Tantallon along Highway 103.

The Plan places emphasis on the following topics:
- Planning for centres;
- Management of residential development within rural designations; and
- Housing diversity and affordability.

Functional plans will be developed for Opportunity Sites and Affordable Housing. Opportunity Sites are areas within the Regional Centre for the most part that are vacant or under-used. HRM will seek to encourage and provide incentives for the redevelopment of such sites in the Regional Centre and other areas, consistent with the overall intent of the Plan.

A key means of managing residential development within rural designations will be the discouragement of large as-of-right residential development in the Rural Commuter, Rural Resource and Agricultural Designations. Small scale infill development will be allowed on existing roads and on new roads development will be limited.

For large-scale residential development to be considered it will be in some form of open space design. Development agreements will be required to conserve a connected system of open spaces, avoiding and protecting certain areas and using areas with the best suited soils. Criteria for avoidance or protection include: riparian buffers; wetlands; natural corridors; steep slopes; floodplains; scenic views; trails; and historic sites. In addition to preserving open space and other valued natural and cultural features, the intent of open space design is to create a more compact rural residential form with a compact road network, which decreases service costs.

Consistency of Highway 113 with the Plan

Bedford West is a proposed development to the west of Kearney Lake. The major landowner, Annapolis Group, proposes a residential and mixed use development that is currently being considered under a comprehesive development plan (Bedford West Public Participation Committee, 2005). These lands straddle the proposed right-of-way of Highway 113 for a length of approximately 2.5 km and are adjacent to Highway 102. The area is designated as urban settlement in the Generalized Future Land Use, Map 2 of the Plan (HRM, 2005a) and a Suburban District type of settlement centre (HRM, 2005a, p. 49). The community concept plan includes residential neighbourhoods, a community commercial centre and parks and open spaces immediately adjacent to the proposed right-of-way of Highway 113, as well as residential neighbourhood adjacent to Highway 102. The planning for Bedford West has accommodated the potential presence of Highway 113 and incorporated it into the community design. Should Highway 113 not be constructed, there is a conditional plan for the corridor to revert to the zoning of the adjacent proposed land uses. The plan also includes two community collector road crossings of Highway 113 and is centred around a proposed interchange between Highway 113 and Kearney Lake Road.

The Planned Bedford West development of urban settlement adjacent to Highway 113 is consistent with similar developments, including some recently built and still under development, that abut existing 100 series highways. For example, urban settlement areas of development in Clayton Park and Bedford abut Highway 102. Areas of Beechville, Timberlea and Lakeside also are developed adjacent to Highway 103.

Just south of Bedford West and at the western end of the proposed Highway 113 alignment there are designated areas of Rural Commuter land use. These include a recently developed area around Ragged Lake that is part of Kingswood/Blue Mountain and undeveloped lands of the Annapolis Group south of Bedford West. Piercey Investors Ltd. has proposed a development adjacent to the western end of the proposed Highway 113 alignment.

The Settlement and Housing portion of the Plan includes policy specifically addressing traffic capacity on the Hammonds Plains Road and the Beaver Bank Road. On these roadways the traffic levels are at or near capacity, so that restrictions on further subdivision activity have been applied. All further residential subdivision activity will be curtailed until a substantive change is made in roadway capacity for these areas.

The extent that the proposed Highway 113 interacts with the Settlement and Housing component of the Plan is limited. The proposed Highway 113 alignment and adjacent existing and planned residential land use is consistent with generalized future land use within the Plan.

Recreational, Parks and Natural Areas Land-use

These land uses are primarily addressed within HRM's Plan under the topic of Environment. The Plan seeks to address protection of the natural environment in the short term by the establishment of development practices sensitive to water, land and air, and through an integrated system of natural areas, parks, trails and corridors. Watershed studies and functional plans will be used to develop integrated environmental planning practices at the local level.

Open Space and Residential Land-use

The Plan identifies an open space network, designated as Open Space and Natural Resources, that includes the traditional notions of parks and natural areas with lands intended for preservation for agricultural, forest, community form, ecological, historical, public safety or recreational purposes.

Lands with the Open Space and Natural Resources generalized future land use designation are presented as generalized areas on Map 2 of the the Plan (HRM, 2005a). One outlined area extends through the Birch Cove Lakes and Blue Mountain areas to the west at Coxs Lake, and from a part of the shore of Kearney Lake to the Timberlea, Lakeside and Beechville urban reserve areas. This designation does not recognize the proposed alignment of Highway 113 or some privately owned lands in some areas.

Since most of the lands included in the Plan as Open Space and Natural Resources areas are federally, provincially, or privately owned, the Plan promotes cooperation of these diverse land holders for the achievement of good environmental management and planning.

In addition to the general policies to be provided in the Plan under the Environment heading, Functional Plans are to be developed for: Water Quality Monitoring; Open Space; Urban Forest; Potential Hazards to Development; and Emission Reduction.

Under Parks and Trails the Plan identifies Neighbourhood Parks, Community Parks, District Parks and Regional Parks. The parks serve recreational needs and include a trail network to provide linkages between communities and the network of parks. The park function of a Regional Park is described as:

> The primary objective of a Regional Park will be to preserve and protect significant natural or cultural resources. The essential feature of a Regional Park may include, but not be limited to, open space, wilderness, scenic beauty, flora, fauna, recreational, archeological,

> historic or geological resources. A Regional Park will have sufficient land area to support outdoor recreational opportunities for the enjoyment and education of the public. The size of a Regional Park must be sufficient to ensure that its significant resources can be managed so as to be protected and enjoyed. Regional Parks may be federal, provincial or municipal properties and are intended to serve the educational, cultural and recreation needs of the population of the entire region as well as for visitors to HRM.
>
> (HRM, 2005a, p. 30)

Among seven existing and six additional Regional Parks, the Plan identifies the Blue Mountain Birch Cove Lakes Park.

The Plan states:

> A study is in progress to determine appropriate geographic boundaries for the Blue Mountain Birch Cove Lakes Park. It is HRM's intention that, over time, private lands within the boundary be acquired as financial resources of the Municipality permit. Remainder lands may then be redesignated for development as appropriate.
>
> (HRM, 2005a, p. 31)

The referenced study is presented as Appendix B to this report.

Policy E-4 provides for the establishment of a Regional Park Zone:

> E-4 Within all designations, HRM shall establish a Regional Park Zone under the land use by-law. This Zone shall be applied to all Federal Parks, Provincial Parks, Provincial Park reserves, non-designated Provincial Parks and the new Regional Parks designated under this Plan. The zone shall also be applied to the publicly owned lands within the Blue Mountain Birch Cove Lakes Park. This Zone shall permit recreation uses, park uses and other uses as provided by the existing secondary planning strategies for these areas.
>
> (HRM, 2005a, p. 31)

Natural Corridors

Under Natural Areas and Natural Corridors the Plan identifies 14 Natural Corridors "...significant to the on-going connectivity and conservation of HRM's natural network...." (HRM, 2005a, p. 32). They are presented as generalized lines in Map 4 of the Plan. While the primary function of the corridors will be to conserve wildlife habitat, in some cases these also will be intended to conserve riparian, recreational and cultural lands. One of the corridors (number 5, Map 4) extends from roughly Quarry and Susies Lakes to Coxs Lake. The proposed Blue Mountain/Birch Cove Lakes Regional Park is depicted toward the eastern end of the corridor. Proposed policies under the heading Natural Areas and Natural Corridors (policies E-6 and E-7) do not appear to support the delimitation and designation of natural corridors. However, policy that enables the development of an Open Space Functional Plan is provided to that end. The supporting text of the policy statement (E-19) says: The Open Space Functional Plan should consider:

> 1. coordinating and managing a program to research and identify potential natural corridor linkages, community networks and significant natural habitats to guide considerations of future development (see Map 5, Significant Habitats and Endangered Species and Appendix C: Species at Risk in HRM 2004)
>
> (HRM, 2005a, p. 39)

To meet part of the requirements of the Terms of Reference for this Focus Report, TPW, HRM and DNR cooperated in the funding and completion of the Blue Mountain/Birch Cove Assessment Study by Environmental Design and Management Ltd. , which is attached to this report as Appendix B. The study evaluated the valued features of the Blue Mountain/Birch Cove Lakes area and used a GIS based modelling process to support the identification of an ideal Regional Park configuration to preserve the identified values. The study also addressed the co-existence of the proposed Highway 113 with the proposed Regional Park objectives.

Through the assessment study an ideal park configuration has been conceptually identified and is presented in Appendix B. The park area identified is large and cohesive, approximately 1450 ha of land or 1700 ha of land and water. It includes a suggested Core wilderness area, with limited access and a surrounding Edge area, which would include all of the Birch Cove Lakes as well as Blue Mountain Hill. The park concept provides for high accessibility to the Edge area from all the surrounding communities: Timberlea, Beechville, Lakeside; Clayton Park, Glenbourne Estates, Rockingham Ridge; Hemlock Ravine and surrounding communities; Paper Mill Lake; Bedford West; Kingswood/Blue Mountain; and Tantallon; as well as the Municipality at large and visitors to HRM.

The ideal park presented also encloses scenery and viewscapes; unofficial recreation and trails; mature forest stands; significant wetlands and landscape connectivity.

Consistency of Highway 113 with the Plan

Construction of the Highway would traverse to the west of the Birch Cove Lakes area, leaving the largest part of the designated zone as a cohesive area. Open Space and Natural Resource designations are projected across two other existing 100 series highways, Highway 103 to the west of Tantallon and Highway 102 to the north of the Halifax International Airport. Of the planned transportation projects, the Highway 101 connector and interchange crosses Open Space and Natural Resources lands. The Highway 107 extension at Musquodoboit is a project depicted on the Future Transit & Transportation map (HRM, 2005a, Map 7) but which is not listed as a future or planned project in the Plan. This project would extend through lands designated Open Space and Natural Resources.

TPW acknowledges that HRM's Regional Municipal Planning Strategy applies a concept that crosses several themes with the intent of maximizing growth in serviced areas and minimizing growth in unserviced areas, minimizing the numbers of automobiles by decreasing trips, increasing passenger numbers, modal shifts from cars to transit, and other measures. If successful the effect of these combined policies would be to slow the growth in traffic volumes. HRM recognizes the possible future need for Highway 113 and includes Highway 113 in the Plan. However, it is not expected to be needed within the 25 year span of the Plan. The Plan does recognize the continued importance and use of the automobile.

TPW's mandate is to provide a transportation network for the safe and efficient movement of people and goods. Successful implementation of HRM's Regional Plan has the potential to greatly assist in achieving this mandate for the provincial road network within HRM. In particular, management of growth, encouragement of efficient use of existing serviced lands for development, and a comprehensive traffic management plan with significant enhancement of transit services may all serve to improve the safety and efficiency of the highway network, or at least will likely delay the need for substantial upgrades and new linkages. Therefore TPW supports HRM's intentions in the Regional Plan. However, HRM's intention to apply integrated planning, including protection of corridors for future highway needs, would not be well served if other land uses, whether residential development or regional park uses were developed over lands that are available now and offer the only practical alignment for the proposed Highway 113.

The Blue Mountain/Birch Cove Assessment Study (Appendix B) provides the following conclusions summarized below relative to the implications of Highway 113 to the "ideal" Regional Park (*with additional comments provided in italics by TPW*):

- A small proportion of the ideal park is bounded by the Highway 113 corridor and the grade of the highway below the elevation of the park provides mitigation of the visual effects of the highway on the park;
- The Highway 113 alignment where it abuts the ideal park boundary is immediately adjacent to developed residential lands; the Highway right-of-way will serve to curtail further expansion and preserve some lands most appropriate for the park;
    - *In addition, the ideal park boundary would include lands to the east of the Highway 113 corridor that are now privately owned, and would likely be developed for residential use if not incorporated in the park as identified;*
- Highway 113 has the potential to provide a regional access location to the park, as well as immediate access to Blue Mountain, as part of an interchange to Kingswood;
    - *The decision to construct an interchange to serve both or either of Kingswood and the park will be the responsibility of HRM; TPW expects to cooperate with HRM and DNR in determining the need for, location, configuration and conceptual design of an interchange; if no road access to Kingswood will be provided, then TPW will participate in the design and construction of an active transportation crossing of Highway 113 to provide access to the park from Kingswood;*
- The design of the Highway 113 right-of-way should consider mimicking natural landscape forms as well as other aesthetic criteria;

  - *Where practical, considering grades, elevations and other design constraints, the construction of the highway and rehabilitation of constructed and disturbed areas will use natural landscaping and native wild plant species plantings; lighting installations will be minimized; clearing will be limited to the minimum necessary for safety and normal function of the highway; TPW's Integrated Roadside Vegetation Management Manual (TPW, 2002), in the form current at the time of design and construction, will form the basis for vegetation management;*

- The proposed Highway offers the potential for development of an active transportation corridor within the edge of the right-of-way, which could be linked to the park and provide linkage between other active transportation corridors;

  - *While TPW policy normally does not allow extensive uses such as active transportation within 100 series highways rights-of-way, the 150 m right-of-way width planned for this project may provide an opportunity to review the policy;*

- There is concern that Highway 113 would interrupt access for people in all modes of travel into the park; access for Kingswood, Bedford West and Tantallon residents should be provided; trails and portage routes should be provided as part of the corridor through the Crown resource lands between Birch Cove Lakes and the west towards Coxs Lake;

  - *Access could be provided to the park from Kingswood as discussed above related to a Highway 113 interchange; at least two collector roadways will cross the Highway 113 corridor in Bedford West, which will provide connections to the park; an interchange for the connector road from Highway 113 to the Sheldrake Lake subdivision is planned, which could be designed to accommodate pedestrian and active transporation connections across Highway 113; the span over the watercourse between Frasers Lake and Maple Lake will be designed to accomodate safe watercraft and foot crossings of Highway 113; where they are the responsibility of TPW, each of these crossings could be designed to accommodate active transportation, if appropriate, applying the principles of CPTED;*

- Highway 113 has the potential to interrupt the movement of wildlife along the corridor between Birch Cove Lakes and the west as well as isolate plant assemblages;

  - *In consultation with DNR, the provision of passage for a variety of species will be considered in the design of the structure crossing the Maple Lake/Frasers Lake watercourse; in addition, four water crossings will be required over Fishers Brook and Stillwater Run; two of these are fish habitat; avoidance of fish habitat damage and provision of fish passage must be provided for these crossings; in the design of these crossings* *consideration will be given to providing sufficient width and span height to allow the passage of all but the largest wildlife species, which would provide connectivity in areas with less human presence than the Maple Lake/Frasers Lake crossing may have;*

- With detailed highway design, the proposed Highway 113 offers many opportunities for both the protection of the ideal park land area by limiting development expansion and for providing significant regional and local access to the Blue Mountain/Birch Cove Lakes Regional Park when it is established;
    - *TPW will participate with HRM and DNR in the subsequent processes of planning for the Regional Park, through the Strategic Joint Regional Transportation Planning Committee and, as appropriate, the development of the Open Space Functional Plan.*

Options for Integrated/Collaborative Planning

Through the development of the Blue Mountain/Birch Cove Assessment Study (Appendix B) TPW, DNR and HRM have demonstrated the beginning of the process of integrated and collaborative planning towards the creation of the Blue Mountain/Birch Coves Lake Regional Plan. Participation by TPW with HRM and other stakeholders in the Strategic Joint Regional Transportation Planning Committee is expected to be the primary method for determining the need for and construction timing of the proposed Highway 113. TPW is willing to participate in other processes such as the Transportation Master Plan and five subsidiary Functional Plans, as well as the Open Space Functional Plan and others where it is appropriate.

It is TPW's intention to construct Highway 113 when it is needed, and similar to HRM must spend funds wisely and appropriately. The attached study (Appendix A) indicates traffic loads may be sufficiently high that Highway 113 could provide sufficient benefit to justify its construction by the end of the 25 year planning horizon. The study modelled traffic volumes with and without Highway 113 assuming a 1% growth in traffic volumes. This is a substantially lower rate of increase than has occurred recently in HRM. Implementation of the Plan and various other factors, such as high fuel costs, could change the volume and patterns of vehicle use. The relative success of the Plan and effects of other factors could accelerate or delay the need for the highway.

TPW will participate in the Strategic Joint Regional Planning Commission to consider the Provincial role in meeting the potential transportation needs throughout HRM as the Plan is implemented and progresses. Among the other projects, the needs of HRM as well as provincial requirements and responsibilities will be considered in the decision if and when Highway 113 will be constructed. Consequently it is necessary for TPW to obtain the right-of-way and reserve the lands to allow Highway 113 construction at some yet to be determined future date.

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delphiMRC

Highway 113 : A Demand and Strategic Context Focus Study

This study examines the demand and strategic context of the potential transportation impacts resulting from the proposed Highway 113, Nova Scotia.

March 29, 2006

Delphi-MRC Project Team

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1 INTRODUCTION & UNDERSTANDING

1.1 The Context and Scope

This transportation demand and strategic context focus study is a component of the Department of Transportation and Public Works' (TPW) strategic and long-term transportation planning process that is intended to improve transportation throughout Nova Scotia's key highway corridors. It is integral to the long-term planning process and is one of the preliminary steps to ensuring transportation investment is made where it's needed, when required, and implemented in a cost-effective way.

The Department of Transportation and Public Works (TPW) carried out a preliminary transportation demand analysis for the proposed Highway 113 some years ago. This report was commissioned by TPW to provide an independent transportation demand analysis that does not rely on previous work completed to date and is intended to provide information for future strategic-level decisions which may have to be taken to help preserve a corridor.

In this study we examine the transportation demand and strategic contexts specific to the proposed Highway 113 for the planning horizon year 2026. This horizon year aligns with the Halifax Regional Municipality's Regional Plan and the population and employment information used in the travel demand component of this study.

1.2 The Regional Context

The focus of this analysis is in the vicinity of the proposed Highway 113. It encompasses mainland Halifax and areas to the south-west and north to Hammonds Plains Road (Route 213). A map illustrating the general study area is illustrated in Figure 1.

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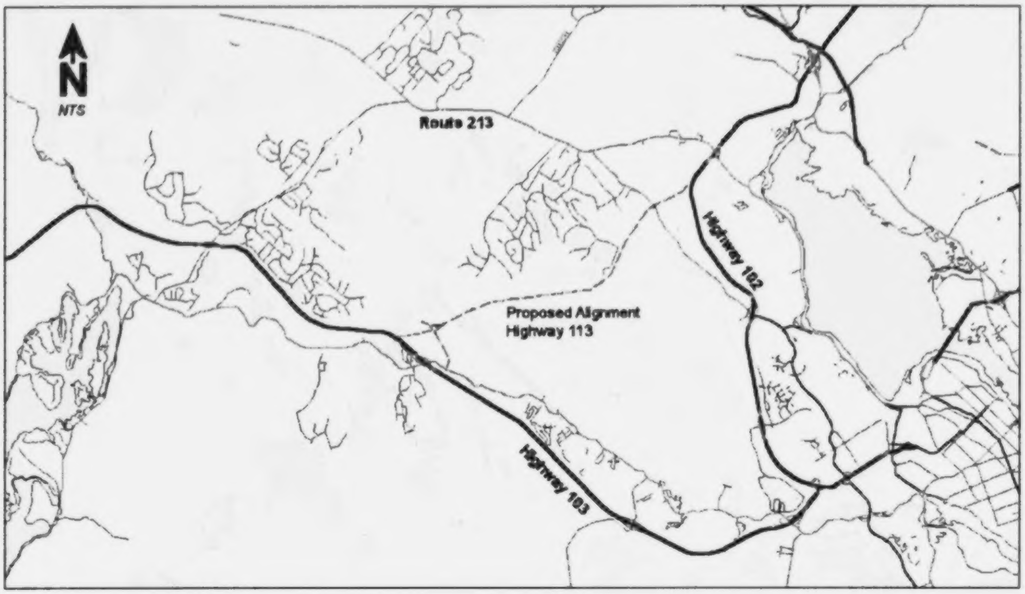
Figure 1: Regional Context



Although we describe the Regional Context as being in the vicinity of the proposed Highway 113, we cannot overlook the evaluation of the total regional context when dealing with travel demand for a controlled-access facility such as the proposed Highway 113. Therefore, in Section 4 we provide a discussion of transportation modelling under the regional context, which expands on our study area to include the entire Halifax Regional Municipality (HRM).

1.3 Report Organization

Our analysis begins with a review of existing conditions as they relate to ground transportation in the Halifax area and it includes discussions on historic population growth, historic traffic growth, travel desire lines, infrastructure constraints and historical safety performance. This is followed by a discussion of the Halifax Regional Municipality's proposed Regional Plan and its policy-level considerations. Section 4 provides a discussion of the forecast travel demand for Highway 113, should it be constructed. Truck routing changes in the face of the provision of Highway 113 is contained in Section 5, and the final section summarizes the principle findings of our work.

1.4 Our Findings

1.4.1 Travel Demand

Based on the transportation modelling effort, we found that at the horizon year (2026) there is significant demand for a high-speed corridor linking Highway 102 and Highway 103. The forecast base demand is **8,000** to **14,500** daily trips. Given that the travel demand modelling approach used in this exercise does *not* consider the effects of external-to-external trips (including through goods movements), induced travel demand, and the potential for the extension of the Highway 107 corridor (completing the freeway network around the harbour) we expect that this forecast may *underestimate* the actual horizon year traffic volumes forecast using the model. The modelled demand is illustrated in Figure 10.

The findings discussed above confirm the initial review of existing conditions. We conclude that the following may contribute in part to the significant demand forecast for Highway 113:

- ➢ Traffic growth on the major regional highways in the vicinity of the proposed Highway 113 appears to have reached a plateau, indicating that these facilities may be nearing their potential capacity. This could present a major infrastructure capacity issue for both TPW and HRM and planning for this trend should be undertaken immediately.
- ➢ Route 213 (Hammonds Plains Road) has been recognized by both the HRM and TPW as a facility that is nearing capacity. Widening of this roadway could have a severe impact on the adjacent properties.
- ➢ Safety performance conditions appear to have deteriorated on the study area facilities in recent years, indicating that near-capacity conditions may be contributing in part to increased safety risks.

1.4.2 Regional Plan Considerations

HRM forecasts that there would be modest and sustained population and employment growth in the Study Area over the planning horizon to 2026. More specifically, it is understood in the latest Draft Regional Plan that HRM acknowledges the capacity constraints on Route 213 (Hammonds Plains Road).

The Regional Plan's Map 7[1] identifies Highway 113 for future development but anticipates that it would not be required within the 25-year planning horizon. To off-set the demand for additional capacity, HRM intends to control growth in the Hammonds Plains area; and also to increase the level of transit service to the corridor, in hopes of reducing overall vehicular trip demand. These initiatives may address local sources of traffic on Route 213 (Hammonds Plains Road). Further south and west in the St. Margaret's Bay area, vehicle trip demand may be served in part by the planned rural express bus service to Tantallon.

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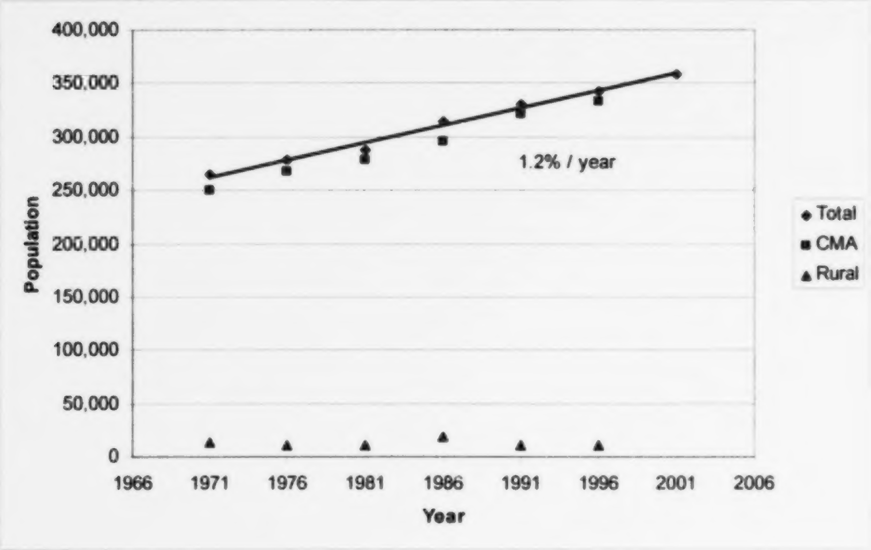
[1] http://www.halifax.ca/regionalplanning/documents/Future_Transit_and_Transportation.pdf

2 EXISTING CONDITIONS

2.1 Historic Population Growth

Using information provided by Statistics Canada, Figure 2 plots the historic population trend over the last 30 years (between 1971 and 2001). Population levels were listed separately for the rural areas and for the metropolitan area (CMA) until 1996 – the year after amalgamation occurred. The annual growth rate has been 1.2 percent.

Figure 2: Historical Population Growth in HRM



2.2 Historic Traffic Growth

Historic traffic growth provides an indication of the trend of travel demand. It is typically measured as an average daily volume measured over an entire year and expressed as an Average Annual Daily Traffic volume (AADT). This information was provided by TPW[2].

2.2.1 Regional Growth

From the historically recorded traffic it was possible to determine an average annual traffic growth rate that is considered representative of regional traffic growth. This is shown in the following Table.

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[2] Traffic Volumes: Primary Highway System 1994-2003. Published by the Nova Scotia Department of Transportation and Public Works. 2004.

Table 1: Regional Traffic Growth on the Major Highways in HRM (1994-2003)

Highway	Description	Annual Growth Rate	Regional Average
101	Between Exits 2 & 3	2.9%	**5.1%**
102	Average between Exits 1A & 3[A]	9.0%	
103	Between Exits 2 & 3	3.9%	
118	Between Hwy 107 & Hwy 102	3.8%	
213	Between Lucasville & Hwy 103	5.9%	

The results indicate a Regional average traffic growth rate on the major HRM highways of just over 5 percent annually. Typically, long term average growth rates on North American highways range between 1 and 2 percent - with rates above the 2 percent mark being considered aggressive. The 5.1 percent figure noted in this case certainly merits that description.

One indicator of travel demand is population growth, and these are often strongly correlated. More people residing in a region create a greater propensity for trip making (*i.e.* trips to work, shopping trips, and other activity-based trips). If we recall the population growth rate over the last 30 years was approximately 1.2 percent annually, and compare it to the traffic growth rate (of just over 5.1 percent), it appears that travel demand is increasing at a rate substantially above that of population. If this is indeed the case, it could present a major infrastructure capacity issue for both TPW and HRM and planning for this trend should be undertaken immediately.

2.2.2 Highway 102 & Hammonds Plains Road (Route 213)

Table 1 identifies two arterial roads with significantly higher annual growth rates: Highway 102 and Hammonds Plains Road. These are important arterial links in our study area and are worthy of discussion.

Highway 102

Volume data for Highway 102 between 1972 and 2005 was provided by TPW and indicated a growth trend of about 9 percent per annum. The rate of growth appears to have reached a plateau over the last 3-5 years and may be an indication that the highway is nearing capacity.

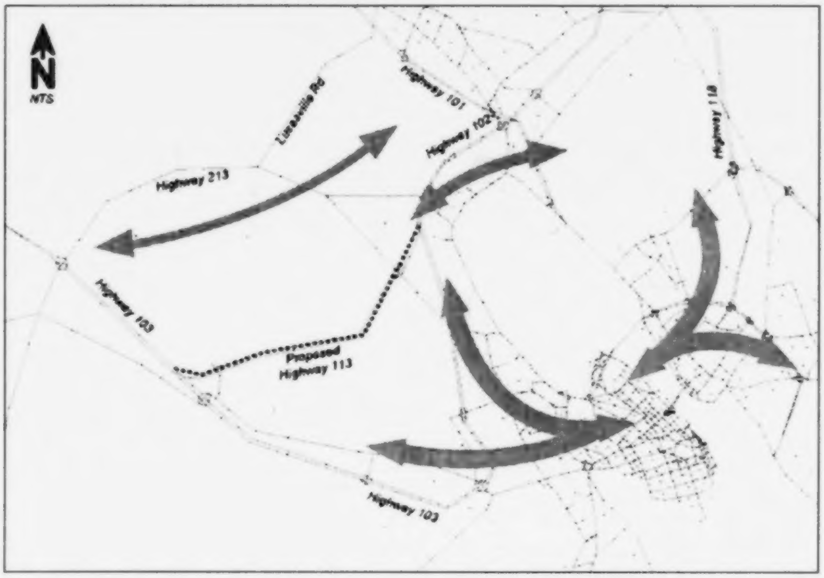
Hammonds Plains Road (Route 213)

Hammonds Plains Road has an annual growth rate less than Highway 102. While the volumes on this facility do not yet appear to have leveled off, they are not infinitely sustainable, and as the roadway approaches its capacity, traffic volumes will begin to flatten. At that point, demand management considerations become an important element of any overall transportation strategy, unless further roadway infrastructure investment is contemplated.

2.3 Regional Travel Desire Lines

Desire lines are simply lines on a map that indicate the flow of people or goods from a point of origin to a destination (and vice-versa). They do not necessarily represent the exact routing that people would follow traveling between these points. Typically the width of a desire line quantifies the magnitude of the flow being illustrated (*i.e.* a larger line indicates a greater desire to follow the particular desire line).

Figure 3: Regional Travel Desire Lines



As we can see, the Halifax peninsula represents the major trip gravitational centre in the Region from which a significant portion of trips originate, or to which they are destined. To a lesser extent, the travel corridor around the Bedford Basin also represents an important desire line created by the topography of the Region. These of course are not all the significant desire lines in the HRM and we have only illustrated the lines relevant to this study - including a line between the St. Margaret's Bay District (Tantallon and points south) and the Bedford/Sackville area.

We can use these desire lines to develop a better understanding of the service function of each of the major travel routes in the vicinity of Highway 113. These facilities include Highway 102, Highway 103 and Route 213 (Hammonds Plains Road):

Highway 102 & Highway 103 – Each of these freeway facilities provides a predominant commuter function to/from Halifax peninsula. This corridor also provides a regional travel route between the St. Margaret's Bay area and Bedford/Sackville but this function appears to be much less significant relative to its commuter function. We note however, that these routes do provide an important route for truck traffic and goods movements in the Region due to the restrictions for heavy vehicle use on Hammonds Plains Road.

Hammonds Plains Road (Route 213) – This two-lane, two-way highway provides the dual functions of serving both cross-regional travel and commuter trips for the communities located along the corridor. The Lucasville Road is also part of this corridor and is used by travellers to the Annapolis Valley area. The cross-regional travel function provides an alternative to the Highway 102/103 corridor except for heavy vehicles.

In light of this subjective analysis, it appears that the implementation of the proposed Highway 113 would have an impact on commuter trips travelling between Bedford/Sackville/Dartmouth and points south and west of the Region. It would also help alleviate capacity constraints.

2.4 Current Highway Constraints

Identification of existing system constraints provides insight into current problems and assists in identifying potential future solutions. In this strategic analysis, we deal only with the main highways in the study area where significant constraints exist as discussed below. Figure 3 provides a summary constraints map.

2.4.1 Highway 102

Highway 102 between Hammonds Plains Road and Highway 103 is a four-lane divided freeway with a posted speed limit of 100km/h. Highway 102 is nearing capacity due to a sustained and aggressive annual growth rate of 9 percent. Compounding this issue is the fact that significant residential developments are planned in Bedford South and Bedford West that will contribute to increased travel demand between Bedford and the Halifax Peninsula.

As the only north-south freeway connection to the Halifax Peninsula, and as this highway reaches capacity, further volume growth could result in any of the following:

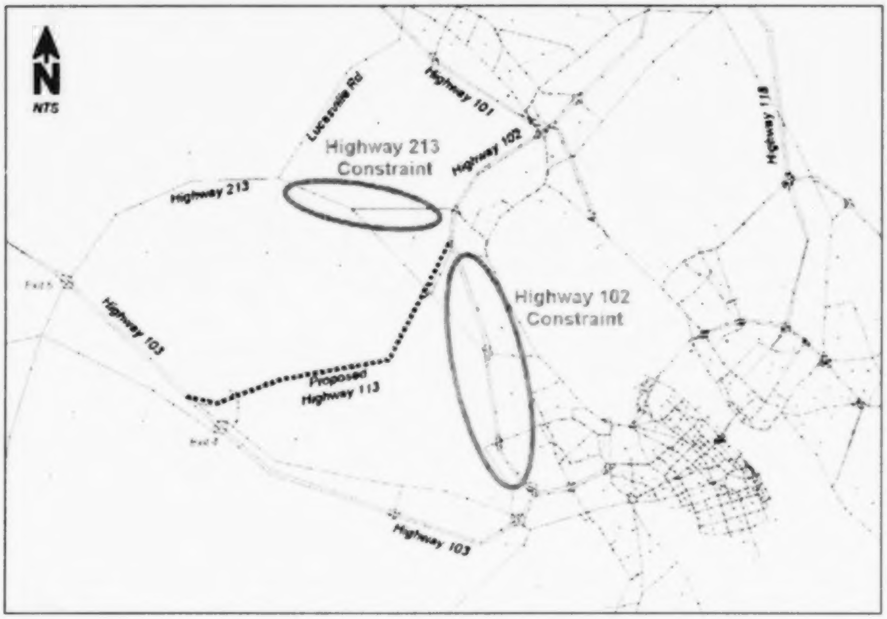
- Traffic will divert to other arterial streets in the corridor (many are already at capacity),
- Users may switch to other modes such as transit (if the mode is providing adequate service levels), or
- Businesses may seek to locate outside of the downtown areas altogether - putting significant pressure on the suburban arterial and freeway road network.

The latter is of considerable concern for HRM and is contrary to the Regional Plan policy. However, the policy actually favours the use of transit. The capacity constraint would, in fact, likely contribute to greater transit use provided that transit service expansion keeps up with travel demands. It is also notable that development has progressively encroached along this section of Highway 102 and now represents a significant constraint to any future expansion. There are currently no plans to widen Highway 102.

2.4.2 Hammonds Plains Road (Route 213)

The two-lane, two-way Hammonds Plains Road connects Highway 102 at the Hammonds Plains Road interchange to Highway 103 in Upper Tantallon (Exit 5). This is viewed by many commuters as a more convenient route than the Highway 102/103 corridor and as a result is nearing capacity. While TPW has made efforts in recent years to impose access control between Upper Tantallon and the Pockwock Road, development has continued between Pockwock Road and Highway 102. This has resulted in several suburban subdivisions developing along this route, which add to the volume levels and increased safety risks. There are no plans to widen Hammonds Plains Road and to do so would create significant property impacts.

Figure 4: Existing Study Area Constraints Map


N
NTS
Lucasville Rd
Highway 101
Highway 102
Highway 213 Constraint
Highway 213
Highway 118
Exit 5
Highway 103
Highway 102 Constraint
Proposed Highway 113
Exit 4
Highway 103

2.5 Historic Safety Conditions

A review of TPW's collision data for the study area was carried out. We looked at collision rates, frequencies and severity in this analysis. This analysis should not be considered a comprehensive safety performance review and is only intended to provide insight into recent road safety trends. The results of the collision rate review are contained in Table 2.

Table 2: Historic Collision Rates on the Study Area Highways

Highway	Control Section	Facility Type	Length (km)	Avg AADT Volume	1998-2002 Rate (hmvk)	1999-2003 Rate (hmvk)	Section Trend	Highway Trend
102	Exit 1A to Exit 2A	Class 2 - 4-lane freeway	2.37	35,576	20.8	23.4	↑	↑
	Exit 2A to Exit 2	Class 2 - 4-lane freeway	3.22	37,180	82.4	87.9	↑	
	Exit 2 to Exit 3	Class 2 - 4-lane freeway	5.03	33,700	54.0	52.4	↓	
103	Exit 1 to Exit 2	Class 2 - 4-lane freeway	1.22	22,960	127.2	140.8	↑	↑
	Exit 2 to Exit 3	Class 1 - 4-lane freeway	4.42	17,368	30.0	25.7	↓	
	Exit 3 to Exit 4	Class 5 - 2-lane arterial highway	7.21	14,104	19.9	24.8	↑	
	Exit 4 to Exit 5	Class 5 - 2-lane arterial highway	6.86	12,434	45.6	43.7	↓	
213	Hwy 102 to Lucasville	Class 11 - 2-lane collector highway	1.35	16,286	256.7	264.2	↑	↓
	Lucasville to Hwy 103	Class 11 - 2-lane collector highway	5.93	12,268	126.5	119.8	↓	

Collision rates are measured in "collisions/hundred million vehicle kilometres" or hmvk.

The trends shown in Table 2 indicate an increase in the collision rates on Highways 102 and 103 and a decrease in rates on Hammonds Plains Road. The increase in collision rates on Highways 102 and 103 indicates a worsening of safety performance. A review of the frequency and/or the severity of these collisions provided additional insight.

Table 3: Collision Frequency and Severity on the Study Area Highways

Highway	Control Section	1998-2002 PDO Collisions	1998-2002 Injury Collisions	1998-2002 Fatal Collisions	1998-2002 Total Collisions	1999-2003 PDO Collisions	1999-2003 Injury Collisions	1999-2003 Fatal Collisions	1999-2003 Total Collisions
102	Exit 1A to Exit 2A	22	10	0	32	24	12	0	36
	Exit 2A to Exit 2	124	56	0	180	136	56	0	192
	Exit 2 to Exit 3	108	59	0	167	105	57	0	162
103	Exit 1 to Exit 2	43	21	1	65	50	22	0	72
	Exit 2 to Exit 3	33	8	1	42	29	6	1	36
	Exit 3 to Exit 4	25	11	1	37	32	12	2	46
	Exit 4 to Exit 5	38	30	3	71	34	30	4	68
213	Hwy 102 to Lucasville	78	25	0	103	79	27	0	106
	Lucasville to Hwy 103	101	66	1	168	98	61	0	159
		572	**286**	**7**	**865**	**587**	**283**	**7**	**877**

The information in Table 3 was gleaned from safety statistics published by TPW and uses the same data sets discussed above for the collision rate calculations. Results indicate that collision frequency has increased by 12 collisions from the 1998-2002 period to the 1999-2003 period. This may be considered a marginal increase; however, the growth rate of traffic volumes (a measure of risk) has flattened in recent years. This in fact, indicates that the relative safety performance on these routes has worsened – resulting in an overall increased risk to drivers. We attribute the increase in collis ion rates to the increase in frequency.

Collision severity is an important metric to consider in that higher severities increase societal costs (loss of life, health care costs, *etc.*). Collision severity trends for the study area highways indicate that the number of fatalities remained the same and the number of injury collisions dropped slightly. Thus the source for the increase in frequency between the two data sets can be attributed to the increase in property damage only (PDO) collisions – considered to be a low-severity collision type.

3 REGIONAL PLAN CONSIDERATIONS

3.1 HRM's Policy for Highway 113

In the HRM policies, the following key highlights are relevant:

The Highway 113 alignment is included in the overall Plan's Transportation and Transit Map (Map 7) but the Plan anticipates that it would not be required within the 25-year planning horizon. Instead, HRM intends to control growth along the corridor (Hammonds Plains area) and also increase the level of transit service to ease pressure on the existing Route 213.

It is worth noting that the transportation policy noted above is a change from the First Draft of the Regional Plan which anticipated a requirement for Highway 113 within the planning period. The change is based on **Section 3.5.2** of the Plan, entitled *Other Growth Management Mechanisms*. This section notes (page 57), "*Traffic capacity along the Hammonds Plains Road ... is either at or nearing the point where restrictions on further subdivision activity are warranted. Until a substantive change is made in the infrastructure capacity within these areas, all further residential subdivision activity shall be curtailed.*"

This statement is supported by HRM **Draft Policy S-22**, which states: *"HRM shall, through the subdivision By-law, limit development within portions of the Hammonds Plains ... community to prohibit residential development on new roads."* Subdivisions already approved or already in the approval process at the time of Plan adoption will be permitted to expand at a rate of up to 25 lots per year. Where streets already exist, new lot development would be limited to a rate of eight per year.

Other Regional Plan initiatives relate to transportation demand management with a focus on improved transit. HRM proposes to introduce a rural express bus service to Tantallon which could be implemented as early as 2009 (based on current budgets). There is also a commitment to meeting minimum service standards for transit. This means that the existing Transit Route No. 33 will have increased frequency in the future.

3.2 Forecast Population & Traffic Growth

Obviously, the population and employment within any region will directly affect travel demand in the area. This section provides an overview of the HRM plan assumptions regarding population and employment distributions for the future HRM.

3.2.1 Forecast Population Growth

Section 3 of the Plan, which focuses on the topic of *Settlement and Housing*, provides an overview of the expected population increase in the Region. The Regional Plan assumes a likely population increase of 84,400 persons and a total population in 2026 of about 446,000. This growth is expected to be by means of natural increase (24,000) and by net inflow (60,000) from other parts of Canada and from immigration.

This equates to an average annual growth rate of 1 percent[3]. This average rate accounts for the cumulative growth over the entire region, over a 25 year period. The Regional Plan proposes the following balance of new settlement in the future:

Table 4: HRM Forecast Population Growth based on the Regional Plan Scenario

Area	Share of Growth (%)	Likely Increase (calculated)
Halifax Peninsula/Dartmouth inside the Circumferential Highway (Capital District)	25	21,100
Suburban areas	50	42,200
Rural areas	25	21,100

Table 4 indicates that the most significant population growth is expected to occur in the suburban areas of the Region. In the vicinity of the proposed Highway 113, the majority of suburban development will likely occur in two areas: Bedford West and the Piercey's lands. These proposed developments are located along the Highway 113 corridor and have reserved lands for the construction of this facility.

If Highway 113 is constructed it is planned that interchanges would serve both the Bedford West and the Piercey's developments at the western end. The Bedford West interchange would connect to Kearney Lake Road (in the vicinity of the Atlantic Acres Business Park) and the Piercy's interchange would connect to Route 3 (in the vicinity of the existing Exit 4 on Highway 103). The transportation demand modelling analysis included these developments and the interchanges that serve them.

It has been contemplated that there may be an opportunity to serve the Kingswood development area with a Highway 113 interchange. If built, the interchange would create access to a high-speed facility. The forecast population in Kingswood may be better served by this access and reduce the demand on Hammonds Plains Road.

3.2.2 Forecast Traffic Growth

Based on the planning forecasts for the Regional Plan growth scenario and knowing the correlation between population growth and trips per person, we expect overall traffic volumes on the entire regional road network to increase by rates similar to that of the population forecast – a conservative average of approximately 1 percent per year over the long term. This growth rate is intended to be descriptive of an average regional rate and may not necessarily be appropriate for the high demand highways.

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[3] It is worth noting that the Conference Board of Canada forecasts a higher rate of growth. The Board predicts that the population will reach 450,000 by the year 2020. (Source: Greater Halifax Partnership)

4 REGIONAL TRAVEL DEMAND – IS THERE DEMAND FOR HIGHWAY 113?

Future travel demand is forecast using complex transportation models - computerized mathematical forecasting tools – similar in concept to weather models or earthquake prediction models. They provide a means to determine approximate future traffic volumes on the road network based on a "snapshot" of the existing road and traffic conditions, and future predictions of population and employment growth. The model used for this analysis is the Halifax Regional Municipality's Quick Response Software II (QRSII) model.

The QRS II transportation model follows generally accepted methodologies and practices for engineers and planners throughout North America. It is a common tool used to predict corridor-level (coarse) travel demand and is appropriate for long-term planning purposes. A more detailed discussion on the model is provided in Appendix A.

4.1 The Transportation Model Results

A "select link analysis" is carried out during a transportation modelling process in order to derive information that pertains to a selected roadway segment (in this case Highway 113). We used such a technique to help us determine:

1. The origins of trips based in HRM that would utilize Highway 113 in the horizon planning year (2026), and
2. The projected shift in travel demand on key routes as a result of implementing Highway 113.

The findings are discussed in the following Sections.

4.1.1 Trip Origins

Figure 5 provides a schematic summary of our select link analysis on Highway 113.

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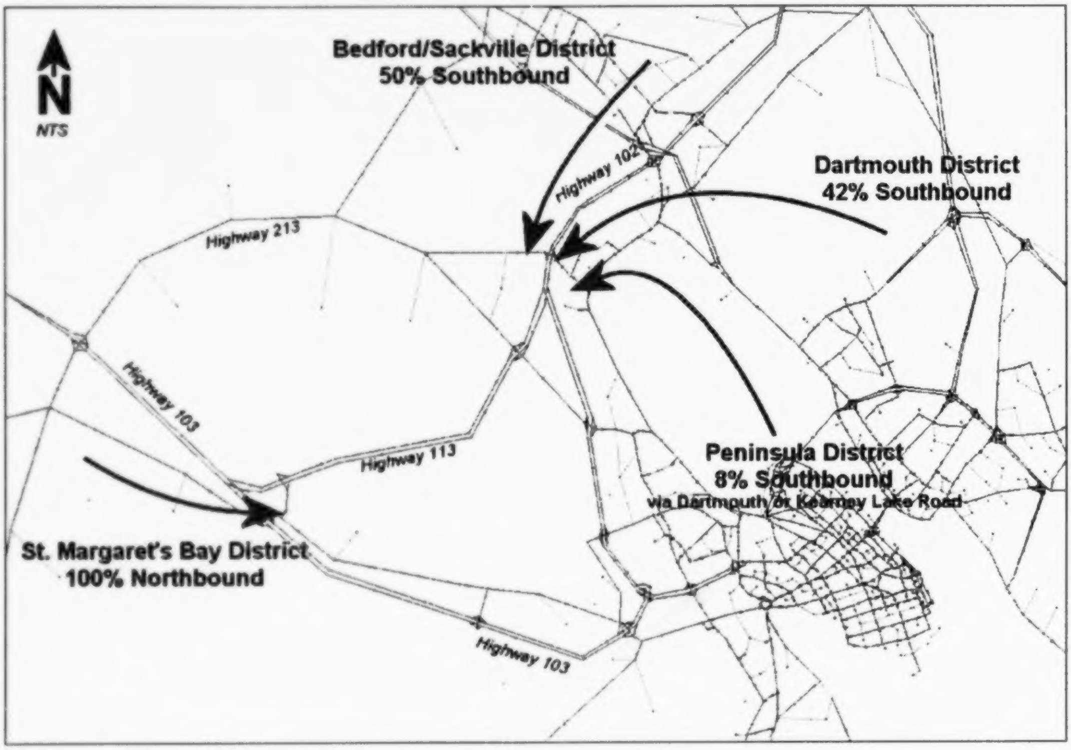
Figure 5: Origins of Trips Likely to use Highway 113 in 2026


N
NTS
Bedford/Sackville District
50% Southbound
Highway 102
Dartmouth District
42% Southbound
Highway 213
Highway 103
Highway 113
Peninsula District
8% Southbound
via Dartmouth or Kearney Lake Road
St. Margaret's Bay District
100% Northbound
Highway 103

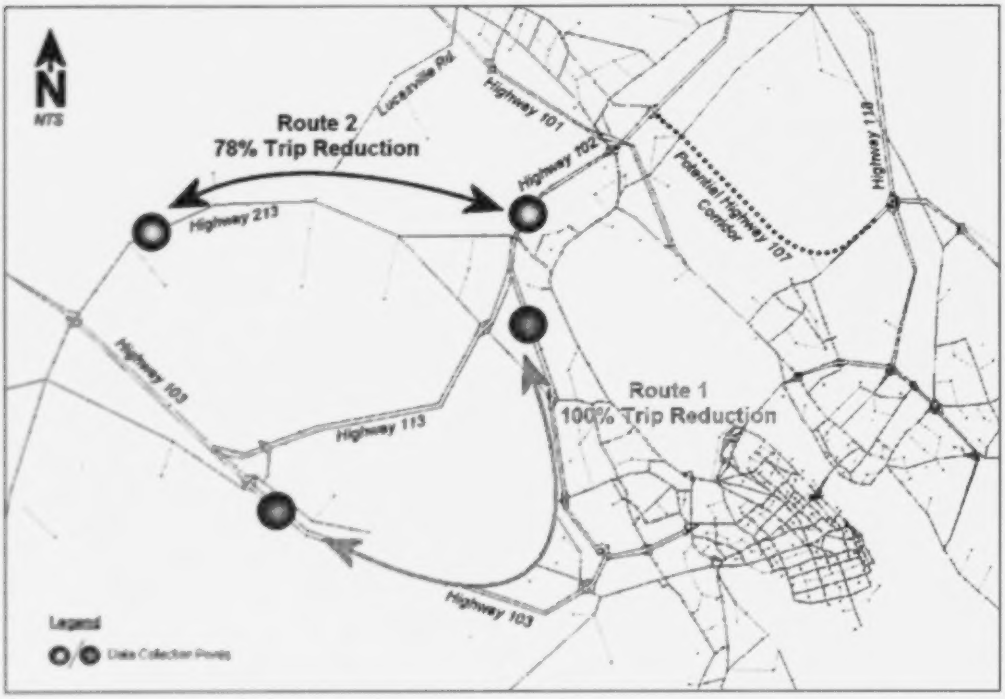
The majority of trips forecast to utilize Highway 113 (in the southbound or outbound direction) are originating in the northern and eastern areas of the HRM (Bedford/Sackville 50 percent and Dartmouth/Eastern Shore 42 percent).

4.1.2 The Shift in Travel Demand

Our second analysis attempted to quantify the shift in travel patterns from the Highway 102/103 and the Route 213 corridors to the proposed Highway 113 in the planning horizon year 2026.

The Highway 102/103 corridor was identified as "Route 1" and the Route 213 corridor was denoted "Route 2". The analysis reviewed the number of trips between the start and end of each route, both before and after implementation of the proposed Highway 113. This process provided insight into the changes in route choice behaviour as a direct result of Highway 113. Figure 6 illustrates the results of this analysis.

Figure 6: Select Link Analysis: Observed Travel Demand Shift with Highway 113 in 2026


N
NTS
Route 2
78% Trip Reduction
Lucasville Rd
Highway 101
Highway 102
Potential Highway 107 Corridor
Highway 118
Highway 213
Highway 103
Highway 113
Route 1
100% Trip Reduction
Highway 103
Legend
Data Collection Points

The results indicate that the Highway 102/103 corridor (Route 1) would experience a 100 percent reduction in trips. Route 2 is also expected to experience a significant reduction of trips – a 75 to 80 percent reduction. It is clear from these results that the proposed Highway 113 provides an attractive alternative route.

A further review was carried out to determine the number of daily trips that are forecast to shift away from Route 1 and 2. The results are contained in Table 5.

Table 5: Expected Daily Volume Shift as a Result of Highway 113

	2026 Regional Plan Scenario		
Corridor	Before (No Highway 113)	After (Highway 113 in place)	Volume Change
Route 1	250 vpd	0 vpd	-250 vpd
Route 2	2,500 vpd	550 vpd	-1,950 vpd

vpd – vehicles per day

The results in Table 5 are consistent with our reviews of both the Regional desire line patterns and the select link analysis regarding the origin of Highway 113 trips. They indicate that the total volume of traffic currently using the Highway 102/103 corridor for cross-regional travel is relatively insignificant (approximately 250 daily trips). In addition notwithstanding the fact that 100 percent of the "divertable" trips from this particular corridor are expected to use Highway 113 when constructed, the shift is not expected to result in a notable increase in residual capacity on Highway 102.

Having said this, we note that the HRM Model does not consider "external trips" - travel that moves completely through the Region without stopping (with both origins and destinations outside of the Region). These types of trips may include commercial truck traffic or tourism and commuter vehicle trips. The percentage of these trips that may or may not be "divertable" to Highway 113, and their magnitude as a proportion of all Highway 102 traffic is simply not available from our QRS II modelling efforts. While they would most certainly be present and represent a further diversion of traffic to Highway 113, we simply don't know whether that diversion would be significant in freeing up additional residual capacity on Highway 102.

4.1.3 A Summary of the Modelling Results

The following points summarize the findings from this analysis:

- Nearly 100 percent of all trips that are forecast to use Highway 113 are cross-regional trips that originate in either Bedford/Sackville, Dartmouth or the peninsula and are destined to the St. Margaret's bay area or points beyond;

- The Highway 102/103 corridor (Route 1 in this analysis) is considered a circuitous route and adds considerable length to a cross-regional trip. This likely contributes to the fact that the model forecasts a minimal amount of traffic on this route both before and after the proposed Highway 113 is in place.

- Highway 113 provides an attractive high-speed route choice and is expected to attract a significant *percentage* of cross-regional trips from both the Highway 102/103 and Highway 102/213 corridors;

It is also important to note that there are long-term plans for a high-speed facility linking Highway 107 to Highway 102 (in the vicinity of the Burnside Industrial Park). If this facility (sometimes referred to as the Highway 107 Extension) is constructed, and if the proposed Highway 113 is in place, a regional freeway "ring road" circumnavigating the harbour would be complete. As a result, we would expect that the connection between Highway 107 and 102 may attract a greater number of trips to Highway 113 – beyond that forecast by the model.

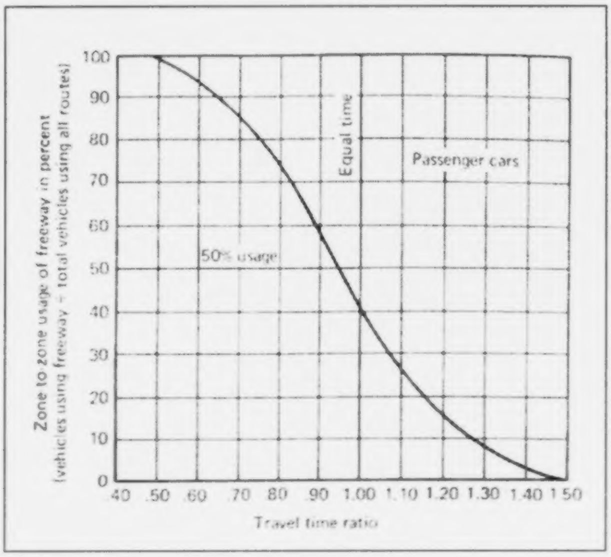
4.2 An Alternative Assignment Technique

In order to provide an additional but independent evaluation of the volumes forecast for Highway 113 in the planning horizon year we carried out an alternative travel assignment technique. The process is founded on Dial's research[4] in the proportional stochastic assignment process that uses travel time ratios between routes as the basis for determining trip diversions between route alternatives. This type of high-level planning is an efficient and useful supplementary method to determine estimates of diversion to new corridors as an additional line of evidence to the traditional transportation modelling approach.

Dial developed a logit relationship describing route choice behaviour based on travel time ratios. This is illustrated in Figure 7. Using this relationship and the modelled travel times for each route choice[5], travel time ratios were calculated for the alternative routes under consideration and shown in Table 6.

In order to carry out the analysis, a cross-regional origin-destination (OD) pair must be identified. We selected the Burnside Industrial Park and Tantallon pair for the cross-regional travel behaviour and the plausibility that this type of trip interchange may occur. The potential major route choices between this OD pair are shown in Figure 8.

Figure 7: Dial's Proportional Stochastic Assignment Curve



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[4] Dial, R. US Department of Commerce. *Traffic Assignment Manual*. Bureau of Public Roads. 1964.

[5] Travel times were determined using the QRS II model.

Figure 8: Location of the Three Route Choices for Travel

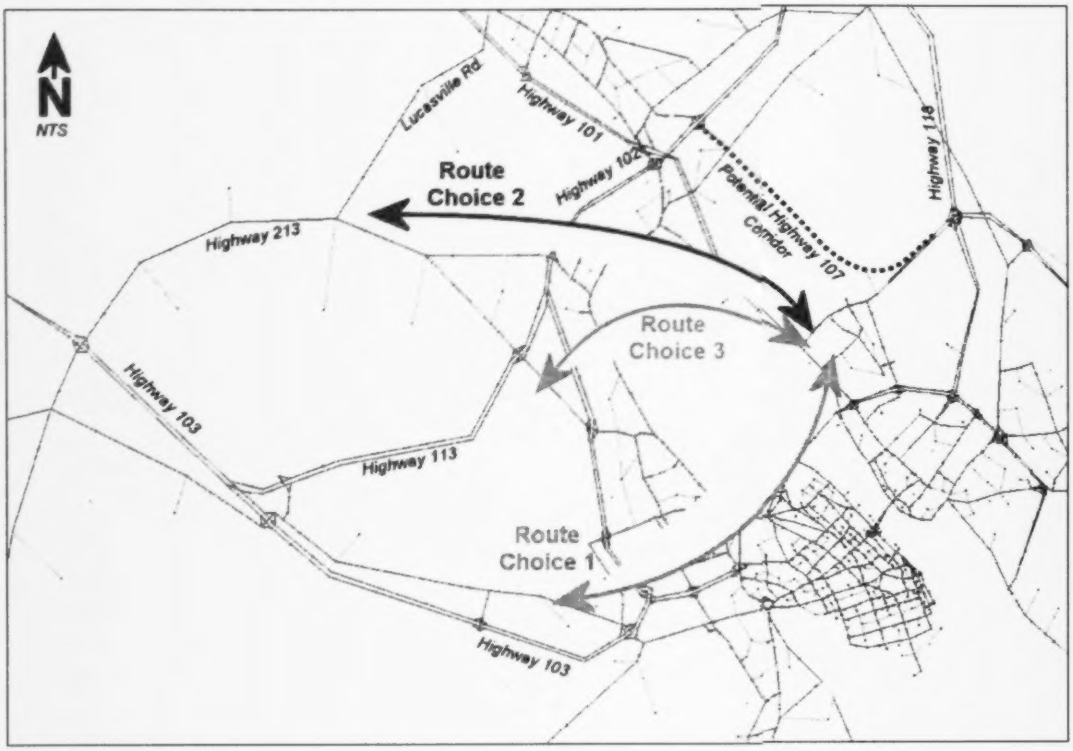
N
NTS
Lucasville Rd
Highway 101
Highway 102
Potential Highway 107 Corridor
Highway 118
Route Choice 2
Highway 213
Route Choice 3
Highway 103
Highway 113
Route Choice 1
Highway 103

Table 6: PM Peak Hour Travel Time Ratios for Routes 1, 2 & 3

	2026 Horizon Year	
	No Highway 113 in Place **Route 1 vs. Route 2**	**With Highway 113** **Route 1 vs. Route 2 +time savings (Route 3)**
Travel Time Ratio	0.901	1.009
Route 1 Percent Usage[A]	58%	40%

A – These values are taken from Dial's proportional stochastic curve

As shown in the table, the estimated difference in the percentage of traffic is 18 percent. This is considered our "attractiveness" factor that is applied to the 2026 corridor volumes for each route choice. Volume estimates of diverted traffic to Highway 113 are contained in Table 7.

Table 7: Estimates of Daily Volume Diversion

	Route 1: Hwy 103	**Route 2: Hwy 213**
2026 Volume (outbound direction only)^{A}	16,500 vehicles	9,000 vehicles
Attractiveness Factor	18%	18%
Volume Reduction (vehicles/hour)	**2,970**	**1,620**

A – Forecast 2026 volumes were calculated using the HRM QRS II model and then converted to daily volumes

Based on the proportional stochastic calculation process it is expected that volumes would be reduced on Highway 103 by approximately 3,000 vehicles per day (outbound); the QRS II model predicted a reduction of 2,200 vehicles per day.

Using the proportional stochastic calculation process on Route 213 a reduction of approximately 1,600 vehicles per day (outbound) is expected. The QRS II model estimated that this reduction would amount to 1,500 vehicles per day.

In summary, the estimated trip diversion from Highway 103 and Route 213 using both the QRS II model and the proportional stochastic assignment methodology yields similar results and the two independent processes appear to corroborate one another.

4.3 Effects of Induced Travel and Latent Demand

When a new transportation facility is opened for use, traffic begins to move upon it. The majority of this traffic is the "base" or "diverted" traffic that would have continued to use old infrastructure if the new facility had not been opened. Most conventional travel demand models (including QRSII) focus their prediction efforts on this component of increased travel, and the component associated with continuing growth of population and employment over time in the region being modelled.

However, there is a well-defined additional component of travel demand that shifts to the new facility as well - something that transportation economists call the "induced" demand. Without going into the complexities of the economic definition of this additional component of demand on the facility, suffice it to say that the "inducement" for travel on this facility is economic in nature - flowing from the (presumably) improved user benefits that result from the new facility and thus attract travelers that might not otherwise have traveled on the facility because they would not have made the trip (by that mode) under the earlier conditions. They may have traveled by another mode, or they may simply not have traveled at all because it was not convenient. The presence of the new facility, and its convenience and cost effectiveness "induce" the person to make the trip. Hence the term "induced demand". Estimating induced demand is difficult, but there is ample empirical evidence of its existence. Strathman *et al.*[6] describe induced travel as contributing to an overall net increase in travel demand. Litman discusses induced travel demand effects and notes that most current transportation models do not account for its existence and hence underestimate the amount of traffic likely to be generated when new facilities are opened or congested roads are expanded[7].

To help us estimate the level of induced travel we carried out a literature review of research studies in North America. A short summary of these findings is contained in Table 8.

Table 8: Literature Review Results for Induced Traffic (As cited in Litman[8])

	Short Term (0-3 years)	**Long Term (>3 years)**
Fulton *et al.*	10-40%	50-80%
Goodwin	28%	57%
Johnson and Ceerla	~	60-90%

The results of this review are obviously highly variable. Nonetheless, they do provide some general guidance in respect of ranges of induced demand that might be expected over time on Highway 113.

The effects of induced demand do extend across both short and longer term periods (as theory predicts), and vary greatly in magnitude. Nonetheless, all are relatively substantial – with the short term range spanning from 10 to 40 percent additional demand on the facility in the first three years. As a prudent measure we recommend that the forecast trips from the QRS II model be increased to a range value between 10 and 40 percent higher than the actual discrete predicted value.

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[6] Strathman, J. *et al. Analysis of Induced Travel in the 1995 NPTS*. Centre for Urban Studies, Portland State University, 2000.

[7] Litman, T., *Generated Traffic and Induced Travel: Implications for Transport Planning*. Victoria Transport Policy Institute, May 2005.

[8] Ibid.

5 TRUCK ROUTE IMPLICATIONS

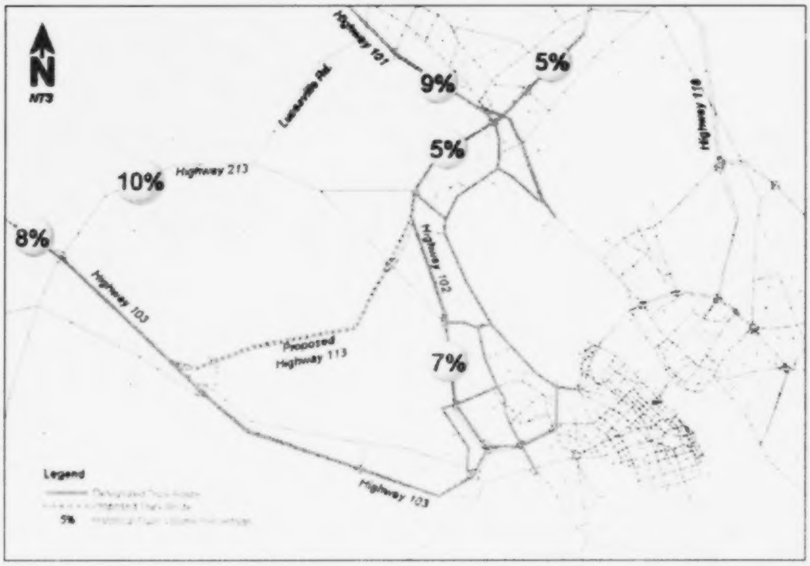
In Canada, the movement of goods via commercial vehicles has become the most dominant method of freight shipment in the last 30 years – surpassing that of rail freight[9]. The amounts of freight on our highways have a significant impact on system infrastructure deterioration rates including pavement conditions, operational characteristics and safety.

5.1 Existing Study Area Truck Routes

Currently, through-trucking movements in the study area (for example, from Truro to Bridgewater) must use the Highway 102/103 corridor to by-pass Halifax – a long and circuitous route. The most direct route may be along Route 213 but through-trucking is restricted on this facility. Due to the constraints on Highway 102 identified earlier, through truck traffic on this Highway may have a substantial deleterious effect on both capacity and safety conditions.

Figure 9 shows the truck route network in the vicinity of the study area. The routes are highlighted in red and truck percentages are supplied at locations where they were available – primarily on facilities belonging to TPW. HRM generally does not carry out vehicle classification counts. Figure 9 illustrates the circuitous route required by through-trucking movements in the Region.

Figure 9: Designated Study Area Truck Routes & Truck Percentages



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[9] As cited from the Ontario Trucking Association. http://www.ontruck.org/issues/docs/railcoop.htm. Accessed on March 16, 2006.

Historical goods movement data is available through Statistics Canada and is collected as part of the census process. This information would provide an accurate indication of the number of commercial truck interchanges in and through the Region and could be used as the foundation for determining an approximate peak hour truck volume on the Highway 102/103 corridor. This type of analysis was not carried out for this study due to budget and time constraints but we expect the number of *peak hour* trips to be less than 10 percent of the existing volume.

5.2 Truck Routes and Highway 113

The implementation of Highway 113 as a truck route could likely attract through-trucking trips and would allow Highway 102 (between Highway 113 and the peninsula) to operate primarily as a commuter freeway servicing the Halifax Peninsula. This would likely improve short-term capacity constraints and more importantly it would reduce safety risks associated with larger vehicles.

Route 213 currently has a relatively high truck percentage considering that through-trucking is not permitted. This is likely due in part to the Atlantic Acres Business Park that attracts and generates commercial truck traffic. It is expected that if Highway 113 is constructed and an interchange is built at Kearney Lake Road, a significant reduction of the percentage of heavy trucks would likely occur. This would improve long-term capacity through the removal of the truck traffic constraints and again, could contribute to reductions in the risks associated with the interaction of conventional passenger vehicles wit h heavy trucks.

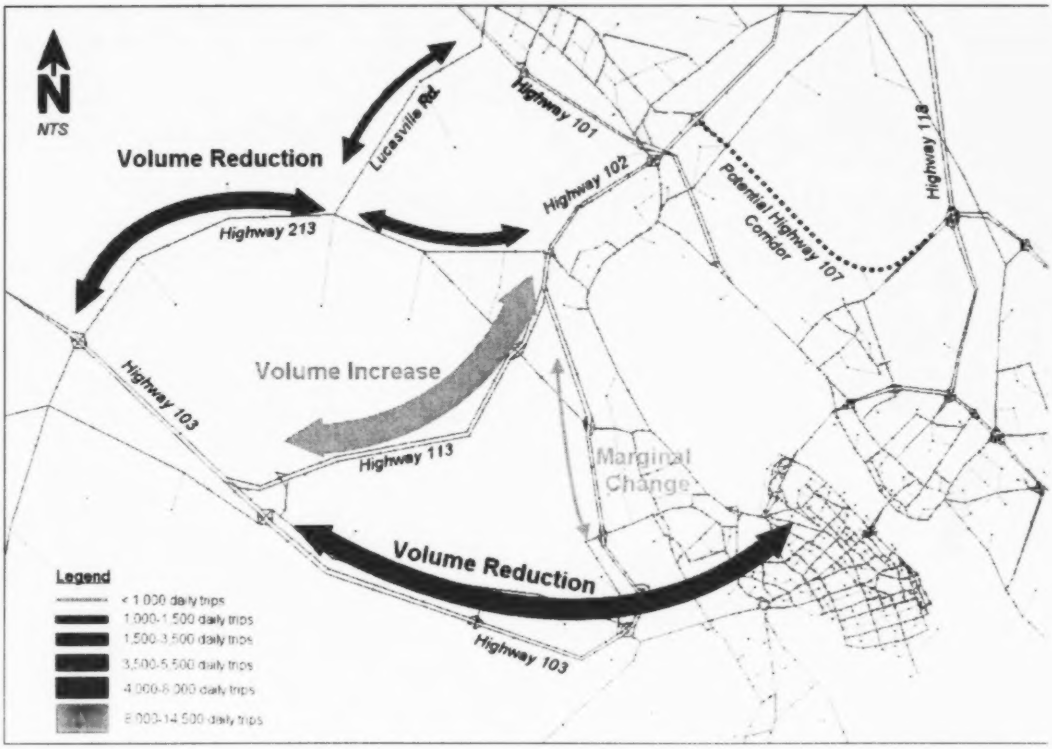
6 FINDINGS & CONCLUSIONS

6.1 Travel Demand

Based on the transportation modelling effort, we found that at the horizon year (2026) there is significant demand for a high-speed corridor linking Highway 102 and Highway 103. The forecast base demand is 8,000 to 14,500 daily trips. Given the effects of external trips (including through goods movements), induced travel demand, and the potential construction of key infrastructure (such as the completion of Highway 107 and an interchange connection to the Kingswood subdivision) we believe that longer term planning should aim to accommodate substantially higher volumes than these baseline predictions.

The base horizon year demand is illustrated in Figure 10 and does not include the additional supplementary demand effects mentioned immediately above. These findings confirm our initial review of existing conditions and were corroborated using an alternative modelling process.

Figure 10: 2026 Travel Demand Modelling Results with Highway 113


N
NTS
Volume Reduction
Lucasville Rd.
Highway 101
Highway 102
Highway 118
Potential Highway 107 Corridor
Highway 213
Highway 103
Volume Increase
Highway 113
Marginal Change
Volume Reduction
Highway 103
Legend
< 1,000 daily trips
1,000-1,500 daily trips
1,500-3,500 daily trips
3,500-5,500 daily trips
4,000-8,000 daily trips
8,000-14,500 daily trips

6.2 Regional Plan Considerations

HRM forecasts that there will be modest and sustained population and employment growth in the Study Area up to the planning horizon of 2026. More specifically, we note that in the latest Draft Regional Plan, HRM acknowledges the capacity constraints that are currently being approached on Hammonds Plains Road (Route 213) and, the need to deal with this reality in the long term.

The Regional Plan's Map 7 identifies Highway 113 for future development but anticipates that it would not be required within the 25-year planning horizon. To off-set the demand for a new corridor, HRM plans to control growth in the Hammonds Plains area; and also to increase the level of transit service to the corridor, in hopes of reducing overall vehicular trip demand. These initiatives may address local sources of traffic on Route 213 (Hammonds Plains Road). Further south and west in the St. Margaret's Bay area, vehicle trip demand may be served in part by the planned rural express bus service to Tantallon.

APPENDIX A – THE TRANSPORTATION MODEL

Overview

Traditional four-step models are useful tools for long term, travel demand forecasting over large regional road networks. They are calibrated based on a macroscopic scale using screen lines. Several arterial roadways make up a screen line and contribute to the overall results. As such, a calibrated model may have an accurate screen line volume (relative to existing volumes) but individual links that make up the screen line may experience volume discrepancies. This is the nature of transportation models.

It is these complexities that must be kept in mind when interpreting absolute traffic volume results from a transportation model and engineers and planners should not base major decisions solely on these values. Instead, the volume results of a model should be considered as coarse estimates and weighed against results from other forecasting methods. What is valuable from the modelling exercise is the relative shift in demand that can be expressed as a proportion.

The estimated volumes resulting from the modelling process represent weekday PM peak hour volumes. However, for the purposes of this report and ease of understanding we have expressed volume forecasts as daily volumes. The modelling process calculates the peak hour travel time delay on each link. Once the delay exceeds that of an alternative route the assignment of volumes tends to plateau (a balancing effect between routes). What is not demonstrated by the model, however, is the lengthening of the peak hour when all the route options become congested - termed peak spreading – in which daily volumes would continue to increase over time but the peak hour volume would remain at capacity.

Model Caveats

Two particular limitations must be noted regarding the existing HRM QRS II model:

1) The model was previously developed without accounting for external-to-external trips. These are simply trips not destined to a location within the region. It was determined that quantifying these trips would be laborious and would not significantly influence the results of this study. Given this conclusion we still deemed these trips important and considered their potential impact in general terms in the concluding discussions.

In general terms, we carried out a literature review to quantify the effect of external-to-external trips. Based on several reports from jurisdictions in the United States, freight studies have indicated a range of 2 to 27 percent of truck trips are external-to-external trips[10,11]. Other studies considering all vehicle types had a range of 3 to 7 percent for all external-to-external trips[12,13]. Of course these numbers may not be directly transferable to the Halifax Regional Municipality but it does provide an order of magnitude indication. Using this general estimate of volumes it is expected that the external-to-external trips for this model represents a volume that is significantly less than the capacity of one travel lane.

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[10] Schlappi, Marshall, and Itamura. *Truck Travel in the San Francisco Bay Area*. TRB 72nd Annual Meeting. Paper No. 930477. 1993.

[11] Matherly, D. *Stream of Traffic Interview Truck Survey: Methodology and Recommendations on Traffic Volume Thresholds*. 75th Annual Meeting of the Transportation Research Board. Paper 960581. 1995.

[12] Yuma Metropolitan Planning Organization. *1990 Origin-Destination Survey*. 1990.

[13] Maricopa Association of Governments. *Phoenix External Travel Survey*. Prepared by Parsons Transportation Group, Inc. Phoenix Arizona. 2001.

2) The model calibration process followed accepted practices and methodologies and the overall regional demand was calibrated within 2 percent of actual 2001 conditions. However, in our study area the "Bedford-Halifax" screenline (screenline 3) which crosses the harbour (and includes Windmill Road, Bedford Highway, Dunbrack Street and Highway 102) was determined to be modelling 2001 volumes lower than observed. The total screenline volume under 2001 conditions was 11,200 vehicles/hour and the model results yielded 10,200 vehicles/hour. This may contribute in part to the reason for the low forecast 2026 volumes on Highway 102 between Exits 1A and 2A.

APPENDIX B – THE FORECAST LINK VOLUMES

The following tables contain the link volume results from the QRS II model for each of the study area links under study. The model results are given in peak hour volumes; however, for ease of understanding we have converted these to daily volume estimates. The conversion process was based on the assumption that the peak hour volume represents 10 percent of the daily volume. This value varies from highway to highway (depending on its service function) but the general average is typically near the 10 percent value.

Table B-1 summarizes the travel demand resulting from the HRM's 2026 Regional Plan planning scenario and Table B-2 summarizes the demand resulting from the HRM's 2026 Base Case planning scenario.

Roadway	Location	2001 Basecase			2026 Regional Plan Scenario						
		No Highway 113			No Highway 113			Highway 113 in place			*Volume Change (two-way)*
		Inbound	Outbound	Two-way Volume	Inbound	Outbound	Two-way Volume	Inbound	Outbound	Two-way Volume	
Highway 113	- West of Trunk 3 Connector	~	~	~	~	~	~	2,500	3,000	5,500	*5,500*
	- West of Kearney Lake Road interchange	~	~	~	~	~	~	3,500	4,500	8,000	*8,000*
	- East of Kearney Lake Road interchange	~	~	~	~	~	~	3,000	4,500	7,500	*7,500*
Trunk 3 Connector	- Between Trunk 3 & Highway 113	~	~	~	~	~	~	1,500	1,000	2,500	*2,500*
Highway 103	- Between Exits 5 & 6	4,000	5,500	9,500	4,000	5,000	9,000	4,000	5,500	9,500	*500*
	- Between Exits 4 & 5	3,300	5,500	8,800	3,500	5,500	9,000	5,000	8,000	13,000	*4,000*
	- Between Exits 3 & 4	7,000	11,000	18,000	7,000	11,500	18,500	6,000	10,000	16,000	*-2,500*
	- Between Exits 2 & 3	10,000	15,500	25,500	10,000	16,500	26,500	8,500	14,000	22,500	*-4,000*
	- Between Exits 1A & 2	13,500	20,000	33,500	14,000	21,500	35,500	12,500	19,000	31,500	*-4,000*
Highway 102	- Between Exits 1A & 2A	11,500	15,500	27,000	14,000	21,500	35,500	13,000	21,500	34,500	*-1,000*
	- Between Exits 2A & 2	14,000	19,500	33,500	19,000	27,000	46,000	18,000	27,500	45,500	*-500*
	- Between Exits 2 & 3	14,500	17,000	31,500	16,000	22,000	38,000	18,000	22,500	40,500	*2,500*
Kearney Lake Road	- Between Highways 102 & 113	2,000	5,500	7,500	6,000	11,000	17,000	5,500	11,000	16,500	*-500*
	- West of Highway 113	2,000	5,500	7,500	6,000	11,000	17,000	5,500	11,500	17,000	*0*
Route 213 (Hammonds Plains)	- East of Highway 102	3,000	4,500	7,500	5,000	4,000	9,000	5,000	4,500	9,500	*500*
	- West of Highway 102	8,000	7,500	15,500	13,500	16,000	29,500	13,000	15,000	28,000	*-1,500*
	- East of Lucasville Road	7,500	11,000	18,500	7,000	8,000	15,000	5,500	7,000	12,500	*-2,500*
	- West of Lucasville Road	6,500	9,000	15,500	6,000	8,000	14,000	4,400	6,000	10,400	*-3,600*
	- East of Highway 103	4,500	4,000	8,500	5,000	4,000	9,000	3,000	2,000	5,000	*-4,000*
	- West of Highway 103	1,500	2,000	3,500	2,000	2,000	4,000	2,000	2,500	4,500	*500*
Lucasville Road	- East of Route 213	2,000	2,000	4,000	3,500	2,000	5,500	3,000	1,500	4,500	*-1,000*
Trunk 3	- West of Highway 103	4,000	6,000	10,000	4,000	6,500	10,500	4,000	6,000	10,000	*-500*
	- Between Highway 103 & Trunk 3 Connector	1,000	500	1,500	1,000	500	1,500	1,000	1,000	2,000	*500*
	- East of Trunk 3 Connector	1,000	500	1,500	1,000	500	1,500	2,000	1,500	3,500	*2,000*
	- West of Exit 3 Connector	4,000	6,000	10,000	4,500	6,500	11,000	3,500	5,500	9,000	*-2,000*
	- East of Exit 3 Connector	1,000	1,500	2,500	1,000	2,000	3,000	1,000	2,000	3,000	*0*

Roadway	**Location**	**2001 Basecase**			**2026 Basecase**						
		No Highway 113			No Highway 113			Highway 113 in place			*Volume Change (two-way)*
		Inbound	Outbound	Two-way Volume	Inbound	Outbound	Two-way Volume	Inbound	Outbound	Two-way Volume	
Highway 113	- West of Trunk 3 Connector	–	–	–	–	–	–	3,500	5,500	9,000	*9,000*
	- West of Kearney Lake Road interchange	–	–	–	–	–	–	5,500	9,000	14,500	*14,500*
	- East of Kearney Lake Road interchange	–	–	–	–	–	–	5,000	7,000	12,000	*12,000*
Trunk 3 Connector	- Between Trunk 3 & Highway 113	–	–	–	–	–	–	3,000	2,000	5,000	*5,000*
Highway 103	- Between Exits 5 & 6	4,000	5,500	9,500	5,000	7,000	12,000	5,500	7,000	12,500	*500*
	- Between Exits 4 & 5	3,300	5,500	8,800	6,500	8,000	14,500	8,000	12,000	20,000	*5,500*
	- Between Exits 3 & 4	7,000	11,000	18,000	11,500	17,000	28,500	9,500	14,000	23,500	*-5,000*
	- Between Exits 2 & 3	10,000	15,500	25,500	16,500	27,000	43,500	13,500	22,000	35,500	*-8,000*
	- Between Exits 1A & 2	13,500	20,000	33,500	22,000	36,000	58,000	18,500	31,500	50,000	*-8,000*
Highway 102	- Between Exits 1A & 2A	11,500	15,500	27,000	17,000	20,000	37,000	15,000	19,500	34,500	*-2,500*
	- Between Exits 2A & 2	14,000	19,500	33,500	19,000	25,500	44,500	19,000	25,500	44,500	*0*
	- Between Exits 2 & 3	14,500	17,000	31,500	18,500	22,000	40,500	18,500	22,000	40,500	*0*
Kearney Lake Road	- Between Highways 102 & 113	2,000	5,500	7,500	6,000	10,000	16,000	6,000	10,500	16,500	*500*
	- West of Highway 113	2,000	5,500	7,500	6,000	10,000	16,000	5,500	9,000	14,500	*-1,500*
Route 213 (Hammonds Plains)	- East of Highway 102	3,000	4,500	7,500	4,500	5,000	9,500	5,000	5,500	10,500	*1,000*
	- West of Highway 102	8,000	7,500	15,500	12,500	15,500	28,000	12,000	14,500	26,500	*-1,500*
	- East of Lucasville Road	7,500	11,000	18,500	10,500	14,500	25,000	9,000	12,000	21,000	*-4,000*
	- West of Lucasville Road	6,500	9,000	15,500	10,000	16,000	26,000	8,000	12,500	20,500	*-5,500*
	- East of Highway 103	4,500	4,000	8,500	7,500	7,500	15,000	5,000	4,000	9,000	*-6,000*
	- West of Highway 103	1,500	2,000	3,500	4,500	4,000	8,500	4,000	4,500	8,500	*0*
Lucasville Road	- East of Route 213	2,000	2,000	4,000	5,500	2,000	7,500	4,500	1,500	6,000	*-1,500*
Trunk 3	- West of Highway 103	4,000	6,000	10,000	5,500	9,500	15,000	6,000	9,000	15,000	*0*
	- Between Highway 103 & Trunk 3 Connector	1,000	500	1,500	2,000	1,500	3,500	1,500	1,500	3,000	*-500*
	- East of Trunk 3 Connector	1,000	500	1,500	2,000	1,500	3,500	3,500	2,500	6,000	*2,500*
	- West of Exit 3 Connector	4,000	6,000	10,000	6,500	10,500	17,000	5,000	8,000	13,000	*-4,000*
	- East of Exit 3 Connector	1,000	1,500	2,500	1,500	500	2,000	1,000	500	1,500	*-500*

Blue Mountain/Birch Cove Assessment Study

Final Report

Prepared for:
Halifax Regional Municipality

Nova Scotia Department of Transportation and Public Works

Nova Scotia Department of Natural Resources

Prepared by:
EDM Environmental Design and Management Limited

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EXECUTIVE SUMMARY

- The Blue Mountain/Birch Cove Lake Study Area is located on the western edge of the Halifax urban core. Highways 102, 103, 3, Hammonds Plains Road, and Kearney Lake Road roughly bound the area. It covers 4,313 ha (10,657 acres) including waterbodies.

- The major private landowners within the Study Area are as follows:

    - Annapolis Group
    - Barrett Lumber Company
    - Gateway Materials Limited
    - Kimberly-Lloyd Developments/Armco Communities
    - Nova Scotia Power Incorporated
    - Parkdale Developments Limited
    - Piercey Investors Limited
    - Sisters of Charity

  Active use is the exception rather than the rule within the Study Area. Gateway Quarry is an ongoing aggregate extraction operation located in the northeast corner of the Study Area near Kearney Lake. Barrett Lumber Company has a forestry operation near Blue Mountain. Nova Scotia Power has a substantial right of way associated with a major transmission line that cuts through the Study Area to the south and west of the Birch Cove Lakes.

- Provincial Crown land covers the western and central portions of the Study Area. The entire Crown holding is under the administration and control of the Nova Scotia Department of Natural Resources (DNR). Its management is primarily governed by the *Crown Lands Act* but is also guided by the *Forests Act* and *Wildlife Act*. DNR's management strategy calls for multiple use integrated resource management for the benefit of many varied stakeholders and interests. This includes such activities and features as outdoor recreation, aesthetic scenery, geology and minerals, wildlife species and habitat, and forests and forestry.

  The Crown land within the Study Area is an "area of interest" to the Department's park and recreation program. Further study should be undertaken in the future to define outdoor recreation opportunities. Consistent with the mandate of DNR, its land use plans are for natural resource opportunities.

- This Assessment Study has evaluated the valued features of the Blue Mountain/ Birch Cove Lakes area. Through this assessment, EDM, in consultation with client representatives, has sought to identify an ideal Regional Park configuration to preserve the identified values. The study must also, as clearly stated in the TOR, address the core objective of the Focus Report requirement: "to assess the co-existence of the proposed Highway 113 with the proposed Regional Park objectives."

- EDM assembled an extensive GIS dataset containing the necessary components for assessment of the Blue Mountain/Birch Cove Lakes Study Area. Data was largely collected and input to GIS during Phase 1 of the project. Assessment was conducted in Phase 2 during which EDM, in consultation with client representatives, assessed site values in relation to defining the proposed Regional Park and necessary measures to ensure compatibility between the eventual park and proposed Highway 113.

- Notwithstanding encircling urbanization, the Study Area remains in a largely natural state. Some trails, logging roads, the Nova Scotia Power right-of-way, and dams built by the Annapolis Group to control the height of water in the Birch Cove Lakes system (i.e., Susies Lake, Quarry Lake, Fox Lake, Washmill Lake, and Charlies Lake) are the primary evidence of human impact. Environmental values in the area were evaluated in terms of valued features identified by local public interest groups, geology and topography, watercourses, vegetation, wildlife, the role of the area as a wilderness corridor providing connection for wildlife traveling north from the Chebucto Peninsula.

- The Study Area is regularly used for recreation with well established, if unofficial, walking, hiking, and mountain biking trails. With the exception of the BLT Trail, a Rails to Trails project undertaken by the Beechville/Lakeside/Timberlea community with assistance from HRM and the Province, no trail has a Letter of Authority from NSDNR recognizing the right-of-way for trails purposes. To the best of our knowledge, none of the trails on private lands within the Study Area is endorsed by any owner.

- Proposed Highway 113 can be viewed as both a potential threat to natural values in the area and an effective barrier to future encroachment by development. Highway construction is not imminent. Its need is based on analysis by the Department of Transportation and Public Works anticipating increasing traffic levels on Highways 103 and 102. It will connect the two highways bypassing the most heavily used sections of the two roads within the Halifax urban core as well as the Hammonds Plains Road. By drawing users from more heavily used roads, it will also improve level of service (i.e., speed and safety) on those roads. Highway 113 was registered by TPW in April 2000 as a Class I undertaking, as required by the Environmental Assessment Regulations under the *Environment Act*. The registration included an environmental impact assessment, which was intended to address all assessment requirements. Based on public and regulatory comments on the registration document, TPW issued two addenda to clarify the original document and address comments. The project was briefly withdrawn and resubmitted in October 2004, in order to redefine the scope of the undertaking. In November 2004, the Minister issued a decision, based on possible adverse or significant environmental effects, that a Focus Report was required. This Assessment Study is intended, in part, to address the requirements of the Focus Report.

- The core of the assessment for this assignment was a GIS-based suitability analysis. Suitability analysis determines the fitness of land for supporting a specific land use. It is an interactive GIS modeling process that allows analysts to explore options, protection criteria, and community and financial issues before any change in land use takes place.

- The suitability attributes to be included in the modeling were determined through the collaborative efforts of HRM, TPW, DNR and EDM, and finalized during a charette held at the Halifax offices of TPW on January 13, 2006. While participants considered many characteristics, the final, agreed on list included the following:

    - Cultural considerations
        i. Pre-contact archaeological potential
        ii. Geological resources
        iii. Other identified attributes (community stakeholders)
    - Watercourse protection
    - Residential suitability
    - Species richness
    - Views from core lakes
    - Active recreation suitability

- The various landscape features described in the suitability models of the Blue Mountain/Birch Cove Lakes landscape, while special to many visitors, do not rank as outstanding at a regional or provincial level of assessment.

- Known significant, unique, or rare individual landscape elements within the Study Area suggest the property should receive greater attention. No individual element identified would greatly diminish the value of the park if it were not included. This suggests that the ideal configuration for the Park is somewhat flexible and can respond to site and community issues as the Park is delineated over time.

- The most "unique" value of this particular landscape is its location. It is a large wilderness patch immediately adjacent to metro. As such, it provides many large patch features including quietness, aesthetic beauty, species diversity and richness, as well as interesting features and forest stands in an urban context. This wilderness patch in close proximity to the urban core provides a rare experience. With this consideration at the forefront, the role of the proposed park for human use within an overall municipal parkland strategy must also be taken into account, as well as the role of the proposed park within an overall strategy for landscape connectivity.

- The proposed Blue Mountain/Birch Cove Lakes Regional Park is not intended as an ecological reserve. Its recommended role is primarily as a human-use park in which the "natural environment" is preserved for human use. Landscape conservation will be undertaken in conjunction with trails and areas for swimming, skating, canoeing and other recreational activities. Nonetheless, the park will have an important environmental role. In addition to maintaining the existing environment, which is regularly impacted by human use, the western portions of the park will facilitate the passage of wildlife.

- The generalized park area encompasses key lands within a proposed access route. Proposed Highway 113 and existing roadways reinforce the area. The bulk of the land within the proposed park area is Provincial Crown holding. A portion of municipal property (PID 40701955) will be required for the park access just south of Susies Lake. The balance of the required lands is private holdings including:

    - Lands around Susies and Quarry Lakes currently owned by the Annapolis Group Inc.
    - Lands encircling Fox Lake owned by Kimberley-Lloyd Developments Ltd.
    - Lands bordering the southwest shore of Susies Lake as well as the southern shores of Big Cranberry Lake and Little Cranberry Lake owned by Parkdale Developments Ltd.
    - Lands to the south of Susies Lake owned by the Sisters of Charity.

- The proposed park area should contain two categories of landscape: "Core" and "Edge" areas. The Core is recommended in the Fox and Ash Lake areas. These lakes are favoured canoe/kayak routes. The park configuration suggests that they, and the landscape around them, will continue to convey a "wilderness experience." Users should not be able to see developed areas and should be buffered from traffic and other noises related to urban activity. Views into the Core are provided from Susies Lake, the main water body actively used by residents and visitors, and from Blue Mountain.

The Edge portion of the parkland should encompass a significant natural area with a more extensive human use component. From within the Edge portion of the park, users will sometimes be able to see some developed lands. Key edge experiences include Blue Mountain lookout, and the south, east, and northern shores of Susies Lake which are recommended for more extensive trail and water-based recreation opportunities. The edge portion of the Park at key park access locations, also offers some opportunity for local communities to tailor the specific recreation program to fulfill some of their identified recreational needs.

Appropriate residential and commercial land uses immediately adjacent to, and somewhat interspersed with the park landscape by virtue of a curvilinear boundary shape, will provide park users for the park, as well as the opportunity for some supporting commercial services for those users. It will also help ensure that the access points benefit from informal surveillance and trails in the edge portion of the park can be developed following CPTED principles.

Large adjacent Crown resource lands managed by DNR under the Category 2 "Multiple and Adaptive Resource Use" provide a significant wilderness corridor connecting the defined park area to broader Crown and resource land areas. This management regime can ensure species movement and long term landscape linkages to lands well beyond the study area. DNR Staff state that DNR intends to maintain the Crown land in the area and manage it as IRM C2 for outdoor recreation and other multiple uses.

- The park is generally defined by a proposed circulation route around the park. Consequently, no existing road will impact the park. Only a small portion of the park boundary touches the Highway 113 corridor, just north of Blue Mountain Hill. The section is approximately 1,400 metres long and constitutes only approximately 7.4 per cent of the total perimeter of the park. The Highway 113 alignment, as proposed, is immediately adjacent to residential development in the Kingswood area that has experienced rapid expansion. The location of the alignment abutting this development will serve to curtail further expansion and aid in protecting the lands considered most appropriate for the park.

  One of the primary benefits of the Highway is that it has the potential to provide a regional access location to the park. An entrance to the park at Blue Mountain could provide access to a feature that is as notable in the landscape as Mont Royal in Montreal, Quebec and Cadillac Mountain in Bar Harbour, Maine. In the future, detailed design of the Highway should consider the proposed park landscape and should include aesthetic criteria such as the creation of a "parkway-like" experience for the motorist.

The greatest concern of the proposed Highway 113 adjacency relative to the park is the interruption of access for people, whether in vehicles, on foot or bicycle, or portaging a canoe on the waterways. A critical component of future highway design must me direct and safe access from each of the neighbourhoods on the other side of the proposed Highway, including: Kingswood, Bedford West, and Tantallon, as well as recognition and access for existing trails and portage routes, following appropriate CPTED principles. In addition, the highway has the potential to interrupt the regular flow of species that is necessary to repopulate a heavily used natural parkland. Highway design that facilitates the movement of a wide variety of plant and animal species should be considered.

For the balance of the park perimeter, separation of the park boundary from major roadways not only reduces exposure to noise and highway pollution within the park, but it also allows the park to be ringed by compatible land uses.

- The Draft HRM Regional Plan proposes a regional park be established in the Blue Mountain/Birch Cove Lakes area. HRM and DNR have not entered discussions on the inclusion of the Crown land block at Blue Mountain in the Regional Park. It is recommended that HRM and DNR work together to develop a detailed strategy to implement the proposed regional park. There are a variety of mechanisms for HRM to work with DNR including HRM's input to Crown land management through DNR's IRM process for Crown lands, which includes the upcoming development of the IRM Long Range Management Framework for the area. In addition, HRM might consider a specific Project Proposal to DNR that would request the development of a joint implementation plan, including a management agreement for the Crown lands such as the current arrangement between HRM and DNR at Hemlock Ravine. HRM also has a variety of options available to obtain additional private lands, including land acquisition, masterplans, development control, public/private partnerships, and wilderness easements.

- The unique partnership of TPW, DNR and HRM that led to the creation of this study is a fine example of inter-governmental cooperation. The Steering Committee acknowledges the Report as an initial stage in what will likely be a long-term relationship to ensure an integrated approach to future highway development, natural resource management and park planning and development. Further discussions will be necessary to define the mechanisms and working agreements that will meet the needs of all three agencies.

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1.0 INTRODUCTION

1.1 PROJECT BACKGROUND

The current parks and recreation system in HRM stands as testimony to the strategic conservation of valued lands. The lands of Point Pleasant Park, the Halifax Common, and the Dartmouth Common were set aside for varied purposes but have come to serve the recreational needs of subsequent generations. In following years municipal, provincial, and federal governments have reserved many areas for heritage, recreation, and natural resource uses. Key lands include the Public Gardens, Fleming Park, Seaview Park, Hemlock Ravine, Long Lake Provincial Park, MacNab's Island Provincial Park, the Citadel, York Redoubt, and strategic waterfront lands around the harbour. The tradition has also guided the development of new areas with the commitment of extensive active recreation areas in the Western Common and in communities such as Sackville and Cole Harbour.

In many cases, areas dedicated for public use have included high value lands on the waterfront or offering views on the water. In the long run, several of the areas noted have been encompassed by development. Notwithstanding, the potential of these properties in other more "directly productive" uses, their reservation has had real economic benefits to the community in many ways, including the following:

- Creation of unique active and passive recreation opportunities in accessible locations
- Preservation of heritage and reinforcement of identity
- Attraction to tourists
- Augmented value of other land uses benefiting from the aesthetic and amenity value of reserved land.

This tradition is being carried forward in the Parks Canada's planning for the Halifax Defense Complex Management Plan,[1] the Province's Integrated Resource Management (IRM) Strategy,[2] and the proposed HRM Regional Plan.[3] The proposed Regional Plan affirms regional park commitments made by the 1975 Regional Parks Plan and identifies six new regional parks, including Blue Mountain/Birch Cove Lakes. The plan also recognizes the importance of inter-governmental cooperation:

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[1] Parks Canada. Halifax Defense Complex Management Plan.

[2] Nova Scotia Department of Natural Resources. "Integrated Resource Management." www.gov.ns.ca/natr/ [illegible]

[3] Halifax Regional Municipality. *HRM Regional MPS – DRAFT 2*, November 30, 2005, p. 30

> Many of the lands within the natural network are under federal or provincial jurisdiction. Private landowners and non-governmental organizations also have an important stewardship role in protecting the natural network. This Plan promotes the cooperation of other government agencies, private landowners, and non-government organizations to achieve good environmental management and planning that supports a more environmentally sustainable form of development in HRM.[4]

The Blue Mountain/Birch Cove Lakes area offers a striking opportunity to continue the practice of reserving natural areas of the region. The lands, as noted in the Terms of Reference (TOR) for this assignment, combine significant natural values with accessibility and well-established traditions of public recreational use. The Nova Scotia Public Lands Coalition characterizes the area as follows.

> Blue Mountain-Birch Cove Lakes boasts a striking and rugged terrain with a large system of undeveloped lakes. Many visitors note a remarkable similarity to the wilderness of the Canadian Shield in northern Ontario and Quebec. White granite bedrock has been extensively carved by glaciers and in some places cracked to form deep fissures. There are many wetlands and some old forest sites.[5]

Approximately half of the Study Area (**Figure 1.1**), furthermore, is in public hands. The largest single landowner is the Province of Nova Scotia, which owns 46.6 per cent of the territory within the Study Area designated for this assignment. This land is managed by the Department of Natural Resources under its Integrated Resource Management or IRM process. The Department defines IRM as follows:

> Integrated resource management (IRM) is a planning and decision making process that coordinates resource use so that the long term sustainable benefits are optimized and conflicts among users are minimized. IRM brings together all resource groups rather than each working in isolation to balance the economic, environmental, and social requirements of society. IRM includes planning for minerals, forests, recreation, wilderness, energy, wildlife, and parks.[6]

---

[4] HRM, *HRM Regional MPS – DRAFT 2*, p.26.

[5] Nova Scotia Public Lands Coalition, "Proposed Blue Mountain - Birch Cove Lakes Wilderness Area." [illegible]

[6] See: NSDNR, "Integrated Resource Management." [illegible]

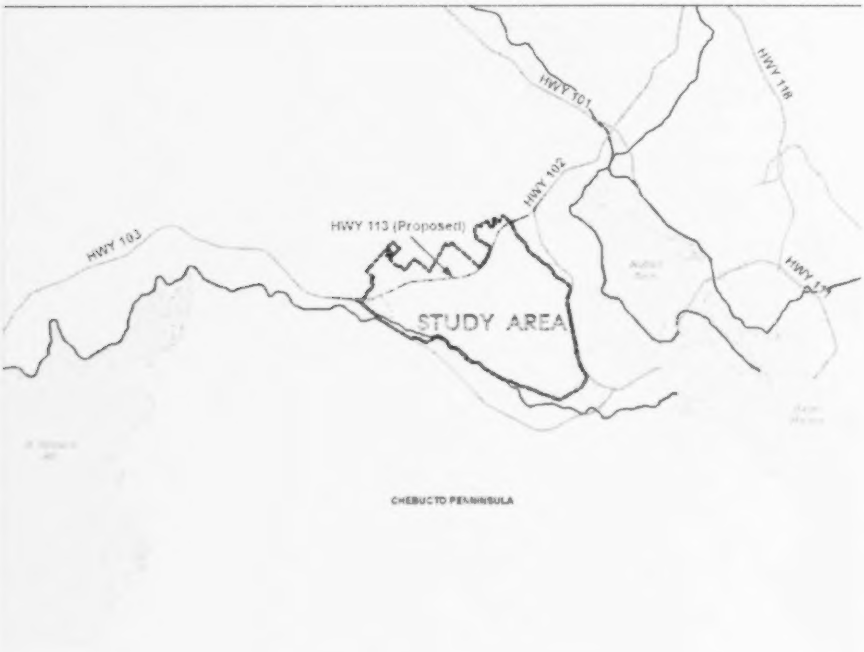


Figure 1.1: Blue Mountain/Birch Cove Lakes Study Area Location

IRM was introduced by the Department of Natural Resources to support the Department's decisions on the management and use of Crown land. IRM is intended to ensure that the Department's decisions reflect consideration of the different resources and special values linked to Crown land.

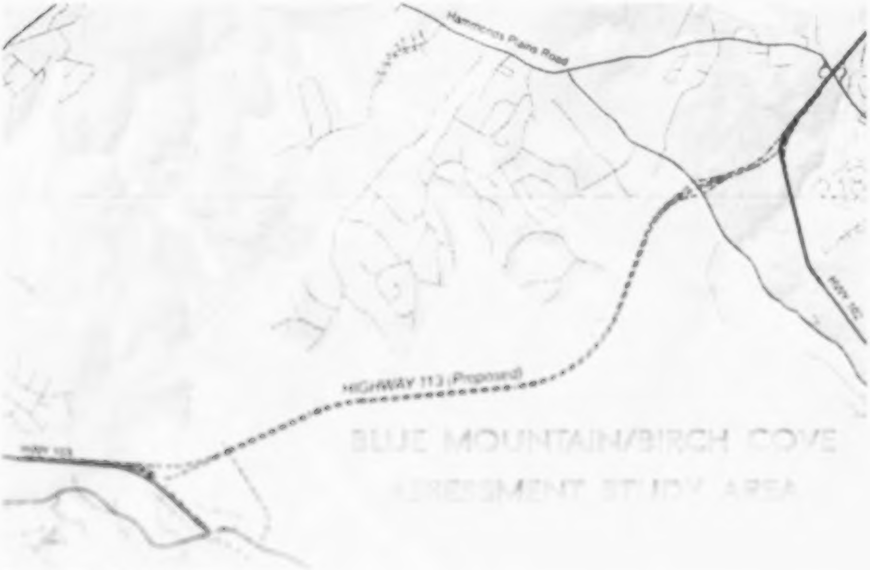
Crown Lands within the Study Area are all classified as Category 2 "Multiple and Adaptive Resource Use" under the IRM classification system for Crown land used by DNR (see **Appendix A, Figure 3**). Generally speaking, lands within the C2 category have special values or uses including significant wetlands, domestic water supply areas, beaches, land leases, park reserves, recreation trail development, and outstanding scenery / viewscapes. The purpose of this category is to ensure that all values are taken into account in the planning process in areas where land use conflicts have been identified. Balancing the interests of all resource sectors may require that management practices for one resource use be modified to enhance compatibility with others. In some instances, critical values may be identified for overriding consideration in establishing management practices. In the Study Area, Crown lands have been identified as C2 for values of outstanding scenery /

viewscapes; significant wetlands; recreation/trail development; and lake/shoreline access.

Any use of land must respect the identified values in the classification. A recent study by DNR has identified the Study Area as an area of interest for park and recreation potential. The Department will conduct further study to define this potential.

The Study Area is adjacent to well-developed areas of Beechville/Lakeside/Timberlea, Halifax Mainland North, and Bedford, some portions of which are in the process of being built out. Development companies active in these areas own several large vacant holdings within the Study Area. These development interests have exhibited varying degrees of interest in proceeding with commercial and/or residential projects on their properties.

In addition, the Province through the Department of Transportation and Public Works (NSTPW) wishes to preserve land for a new highway link to be designated Highway 113 through the area to connect Highway 102 to Highway 103 (**Figure 1.2**). While the connection will be useful to relieve traffic on portions of both highways, the proposed roadway has raised the concern of advocates for the regional park.



Source: NSTPW, July 2004

Figure 1.2: Proposed Highway 113 Corridor

On May 25, 2001, NSTPW submitted an Environmental Assessment Report as part of its corridor preservation process. A decision rendered by the Minister of Environment and Labour has since determined that TPW must prepare a Focus Report to "examine how the proposed Highway 113 fits within the context of the current Halifax Regional Municipality's regional planning efforts, including but not limited to, consideration of parks and natural areas, recreational land-use, transportation corridors and private development."[7]

This Assessment Study has evaluated the valued features of the Blue Mountain/ Birch Cove Lakes area. Through this assessment EDM, in consultation with client representatives, has sought to identify an ideal Regional Park configuration to preserve these identified values. The study must also, as clearly stated in the TOR, address the core objective of the Focus Report requirement: "to assess the co-existence of the proposed Highway 113 with the proposed Regional Park objectives."

1.2 PROJECT PROCESS

The EDM proposal dated September 2005 presented a two-phase plan to address requirements specified in the TOR:

- PHASE 1 – Develop GIS Database
- PHASE 2 – Develop Management Strategy

During Phase 1 EDM researched the issues to be addressed by the study, developed base mapping of the Study Area and vicinity, and determined, in consultation with the Steering Committee, the values to be assessed. This work, completed in December 2005, addressed issues identified from interviewing as well as GIS development. It also described the procedures applied, the data assembled, and the challenges related to interpreting that data. **Chapters 2** and **3** of this Report describe the Phase 1 work. Data assembled for Phase 1 is portrayed on **Figures 1** through **9** in **Appendix A** to this Report.

During Phase 2, EDM refined the appropriate park attributes for the GIS modeling used to assess the Blue Mountain/Birch Cove Lakes Study Area through a charette session with Steering Committee members and invited guests, which took place in January. The individual GIS model results are reflected in **Figures 10** through **21** of **Appendix A** to this report. The maps portray the distribution of site values within the Study Area; the relative quality of Study Area assets in terms of their suitability for recreation use; and the results of impact analysis showing the effect of specified uses on the capability for competing uses (i.e., which uses can co-exist and which diminish or exclude other uses). Analysis of the maps in **Appendix A** considered the proposed Highway 113 corridor in conjunction with environmental and recreational values identified through GIS. This analysis supported the development of recommendations regarding the configuration of the proposed Regional Park and approaches to its management.

---

[7] Memo from Kerry Morash, Minister of Environment and Labour to Brian Stonehouse, Deputy Minister, NS Dept. of Transportation and Public Works. Re: Environmental Assessment - Highway 113, November 12, 2004.

1.3 REPORT ORGANIZATION

The balance of this report is divided into four chapters. **Chapter 2**, immediately following, summarizes data collected and the modest challenges that have been addressed to assemble the GIS database for this assignment. **Chapter 3** describes the Study Area and related issues based on extensive interviewing and review of GIS data. **Chapter 4** describes our analysis of this data and **Chapter 5** defines an approach to park development following from this analysis. **Appendix A** contains maps prepared for the assignment. **Appendix B** contains a list of properties within the study area. **Appendix C** provides a list of individuals interviewed for the study.

2.0 GIS DATABASE DEVELOPMENT

EDM has completed an extensive data collection exercise for this project. Most data was assembled from municipal and provincial sources. Private individuals and not for profit organizations also provided data as noted in **Table 2.1**.

Data Topic	Source
Base Data	HRM
Property	HRM
Zoning	HRM
Contours	HRM
Watersheds	HRM
Proposed Highway 113 Alignment	NSTPW
Forest Inventory	NSDNR
IRM Data	NSDNR
Wetlands	NSDNR, Atlantic Canada Conservation Data Centre
Significant Habitat	NSDNR
Restricted and Limited Use	NSDNR
Digital Orthophotography	NSDNR
Crown Lands	NSDNR
Areas of Significant Natural Value (including) • Significant Old and Unique Forests GIS • Significant Ecosites GIS • Highly Scenic Natural Areas GIS • Significant Lake & Coast Frontages GIS • Sites of Ecological Significance GIS	Dept. of Environment and Labour (NSDEL) NSDNR (Old and Unique Forests)
Candidate Sites of Ecological Significance GIS	NSDEL
Potentially Significant Natural Areas GIS	NSDEL
Natural Landscapes of Nova Scotia GIS	NSDEL
Additional Old Growth Forest	Ecology Action Centre/Chris Miller
Sites Of Ecological Significance	Ecology Action Centre/Chris Miller/NSDNR
Trails	HRM, Chebucto Trails Association, East Coast Mountain Bike Association, EDM
Rare Flora and Fauna	Atlantic Canada Conservation Data Centre
Special Areas	Atlantic Canada Conservation Data Centre

Table 2.1: Data and Data Sources, Blue Mountain/Birch Cove Study Area

Various projections and data formats were encountered and dealt with using EDM's suite of GIS tools. ArcGIS is the standard platform for HRM and the Nova Scotia Government. As such, ArcGIS was used as the point of assembly for all data used in this project.

The result is an ArcGIS 9 dataset containing the necessary components for GIS assessment of the Blue Mountain/Birch Cove Lakes Study Area. Data was largely collected and input to GIS during Phase 1 of the project. Assessment was conducted in Phase 2 during which EDM, in consultation with client representatives, assessed site values in relation to bounding and defining the Regional Park and necessary measures to ensure compatibility between the eventual park and proposed Highway 113.

2.1 PHASE 1 MAPPING

Table 2.1 summarizes data collected in Phase 1 and sources. Using the data outlined in **Table 2.1**, EDM constructed maps relating to the following themes:

- *Property Ownership* ***(Appendix A, Figure 1A)*** – Seven major landowners and their holdings within the Study Area are identified on this map.

- *Crown and Government Owned Land* ***(Appendix A, Figure 1B)*** – Government land is identified and broken down by the three levels of government.

- *Land Use Zoning* ***(Appendix A, Figure 2)*** – Current zoning of lands within the Study Area under bylaws applicable to the Halifax Mainland Area, Beechville/Lakeside/Timberlea, and Hammonds Plains, Upper Sackville, and Beaverbank (Districts 15, 18, and 19).

- *Provincial Holdings/Integrated Resource Management* ***(Appendix A, Figure 3)*** – IRM data obtained from NSDNR. The data is presented thematically by "C" or Category value. Crown parcels within the study area generally fall into the C2 category.

- *Interesting Area Attributes* ***(Appendix A, Figure 4)*** – Old growth forest and items identified by Chris Miller and other sources are displayed on this map.

- *Forest Inventory* ***(Appendix A, Figure 5A)*** – Identified by NSDNR. This dataset is primarily a forest management database, but is also frequently used for habitat identification.

- *Natural Disturbance* ***(Appendix A, Figure 5B)*** – Identified by NSDNR.

- *DNR Ecosections* ***(Appendix A, Figure 5C)*** – Identified by NSDNR.

- *Landscape Features* ***(Appendix A, Figure 6)*** – This map contains four potential model ingredients. The first is areas of steep slopes, which can pose an impediment to movement. The second are wetlands. The third is comprised of landform information. Lastly, animal collisions were approximately located based on data provided by NSTPW.

- *Watersheds (**Appendix A, Figure 7**)* – Major watersheds and associated lakes from HRM.

- *Viewsheds (**Appendix A, Figures 8A, 8B,** and **8C**)* – Views from Blue Mountain, Quarry Lake Hill, and the Waterways (i.e., Birch Cove Lakes) throughout the Study Area. These maps identify viewsheds as calculated by 3D Analyst in ArcGIS.

- *Identified Trails and Waterways (**Appendix A, Figure 9**)* – This map illustrates the variety and distribution of the trail and waterway experiences to be had in the Study Area largely through informal trails defined by user groups consulted for this assignment.

The variety of data sources posed typical issues with regards to assembling the data into a single, well-organized dataset. The range of material also meant a large volume of data to be acquired and assembled. Some of the data collected from private and/or non-profit entities is available for use in the project and the resulting model, but EDM is not currently authorized to distribute it to any other bodies including our clients for this assignment at the close of the project.

2.2 PHASE 2 MAPPING

The balance of maps in **Appendix A** reflect the results of GIS modeling undertaken in Phase 2 of the project.

- Archaeological resources *(**Appendix A, Figure 10**)* – Provincial model from Nova Scotia Tourism, Culture and Heritage Special Places Program identifying potential sites for Pre-European Contact resources. Known archaeological sites have not been displayed on this map as their locations are protected by the *Special Places Protection Act*.

- *Water Protection (**Appendix A, Figure 11**)* – Model of the ability for sediment to enter watercourses based on the Universal Soil Loss Equation.

- *Unserviced Residential Suitability (**Appendix A, Figure 12**)* – Potental model for identifying the best areas for unserviced residential development. Largely based on soil type and depth. Slopes also play a role.

- *Potential Mammal Habitat* ***(Appendix A, Figure 13)*** – Species Richness model for Mammals. Identifies likely habitat for native mammal species.

- *Potential Bird Habitat* ***(Appendix A, Figure 14)*** – Species Richness model for Birds. Identifies likely habitat for native bird species.

- *Potential Reptile/Amphibian Habitat* ***(Appendix A, Figure 15)*** – Species Richness model for Reptiles and Amphibians. Identifies likely habitat for Reptile/ Amphibian species.

- *Species Richness* ***(Appendix A, Figure 16)*** – Composite of **Figures 13, 14,** and **15**. Each of the three inputs is given equal weight.

- *View From 'Core' Lakes* ***(Appendix A, Figure 17)*** – Viewshed from the identified core lakes taking vegetation into account calculated in MFWorks.

- *Active Recreation Suitability* ***(Appendix A, Figure 18)*** – Based on the NSTCH model, this map uses land cover, slopes, and other criteria to identify the raw potential for active recreation. This model does not take into account existing recreation infrastructure.

- *Model Composite* ***(Appendix A, Figure 19)*** – Composite averaged map of the models. All of the models were combined to produce this 'roll-up". Provides a view of areas of common high value.

- *Landscape Connectivity - Western HRM* ***(Appendix A, Figure 20)*** – Generalized map of forested areas and essential corridors for wildlife movement. Key road crossings are identified based on the configuration of forest patches. Provides a 'big picture' for the Blue Mountain/Birch Cove Lakes Regional Park.

- *Land Acquisition* ***(Appendix A, Figure 21)*** – Proposed Park Boundary with key parcels identified.

3.0 OVERVIEW

3.1 STUDY AREA DESCRIPTION

The Blue Mountain/Birch Cove Lake Study Area is located on the western edge of the Halifax urban core. It covers 4,313 ha (10,657 acres) including waterbodies.

Highways 102, 103, Trunk 3, Hammonds Plains Road, and Kearney Lake Road roughly bound the area (**Figure 3.1**). Highway 102 (the Bicentennial Highway) separates the eastern portion of the Study Area from an extensive strip of medium to high-rise apartment structures extending from Clayton Park West to Kearney Lake Road. Elsewhere, urban development has moved across the highway. Particularly notable is the rapidly expanding Bayers Lake Business Park. Some other developed lands have been included within the Study Area. These include a residential strip fronting on Trunk 3 in Timberlea, portions of Lakeside Industrial Park, and residential communities on Kearney Lake.

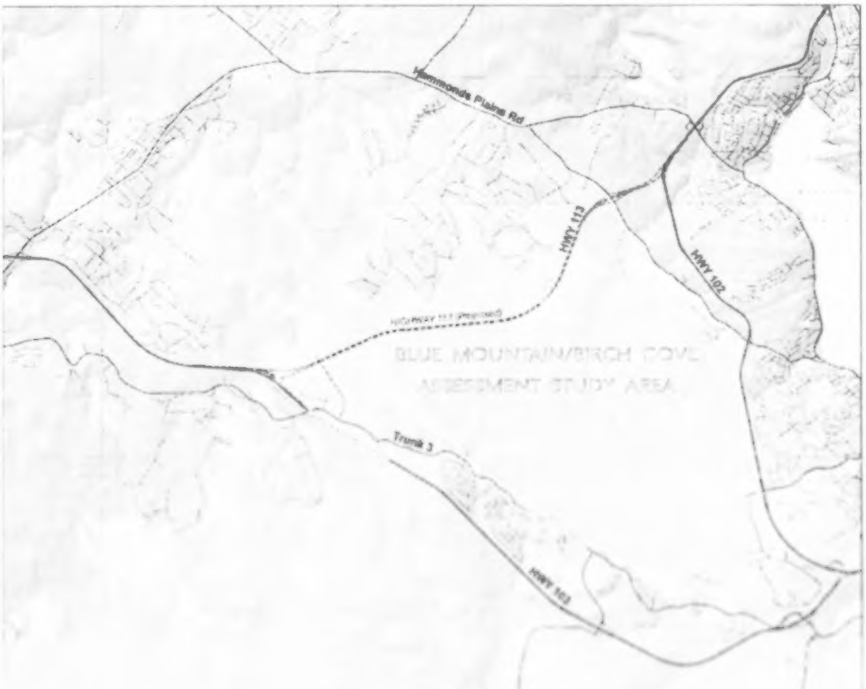

Hammonds Plains Rd
HWY 113
HWY 102
HIGHWAY 113 (PROPOSED)
BLUE MOUNTAIN/BIRCH COVE
ASSESSMENT STUDY AREA
Trunk 3
HWY 103

Figure 3.1: Blue Mountain/Birch Cove Lakes Study Area Boundary

Additional urban development borders the Study Area on the north, south, and west. To the south is the long established community of Beechville/Lakeside/Timberlea, which now offers a diversity of mature and new residential neighbourhoods with supporting commercial uses. On the north is Kingswood Subdivision, which began to develop as a low density, single-family community off the Hammonds Plains Road in the early 1990s. Blue Mountain Estates was developed off Kearney Lake Road next to Kingswood and Kingswood itself expanded considerably to the south and west through several successive phases. A variety of other subdivisions are located off Hammonds Plains Road to the north and west, although fairly substantial undeveloped lands separate these properties from the Study Area boundary.

3.2 MUNICIPAL PLAN POLICY AND ZONING

The eastern portion of the Study Area extending to the Nova Scotia Power right of way, which is clearly visible on aerial photographs of the Study Area, was within the City of Halifax prior to amalgamation. This particular portion of the City was annexed from the County of Halifax in 1981. The City annexed the land to gain more direct control over lands owned by its water utility, the former Public Service Commission, to ensure a buffer between it and potential development in the County of Halifax and to obtain land for industrial development.

Development on these lands has since been regulated under the Halifax Municipal Planning Strategy (MPS). The development of "industrial" uses in Bayers Lake Business Park, which is only partially within the Study Area, is directly addressed by Policy 4.3.1 of the MPS:

> 4.3.1 A mixture of commercial industrial and related enterprises shall be encouraged in the Bayers Lake and Ragged Lake areas. The development standards identified in Policy 4.4 shall ensure appropriate economic development of the lands, accommodating a broad range of industrial, commercial and related uses, and complementing the physical and environmental characteristics of the land.

Policy 4.4 states:

> 4.4 Further to Policy 4.3.1, the Land Use Bylaw shall require that:
>
> (a) sufficient and properly surfaced parking for employees and customers is provided.
>
> (b) all open space areas including yards and setbacks are landscaped;
>
> (c) loading and unloading areas are controlled in terms of location and screening in respect to their adjacency to collector roadways;
>
> (d) the number and size of large signs advertising the business on the lot as well as signage for individual businesses are limited;

(e) billboards are prohibited; and

(f) lakes, streams, and other waterbodies are protected by requiring a minimum setback of any development.

Pursuant to these policies the business park is zoned I-3 (General Industrial), which permits "any industrial/commercial enterprise, except when the operation of same would cause a nuisance or hazard to the public ..." with a few specific exceptions. Development of the park, especially over the past decade, has tended to emphasize retail uses much more than industrial operations. The park is now the primary home of "Big Box" retailers in the region (For illustration of this and other zoned areas discussed following see **Appendix A, Figure 2**).

The balance of the former City of Halifax area is zoned H (Holding). The Holding Zone allows for very limited uses including parks or playgrounds and recreational centres where such can be connected to "existing city services." It also permits "a detached one-family dwelling" with on-site water and sewer services.

Other lands in the Study Area are subject to two plans put in place prior to amalgamation by the County of Halifax. Lands to the north are within the Hammonds Plains/Upper Sackville/Beaverbank planning area, while southern lands are covered by the Beechville/Lakeside/Timberlea planning strategy and land use bylaw. The bulk of land in both cases is zoned MR-1 (Mixed Resource). The MR-1 Zone permits agriculture and forestry uses, light industry, transmission towers, and single and two-unit dwellings, as well as mobile homes.

In the south, the Study Area also takes in the northern end of Lakeside Business Park, which is zoned I-1 (Light Industry). I-1 uses cover a wide range of commercial and industrial operations. The zone is similar to the I-3 Zone covering Bayers Lake Business Park and I-1 uses are permitted in the MR-1 Zone. Additional lands along Highway 3 are generally zoned R-1 (Single Unit Dwelling) or R-1A (Auxiliary Dwelling Unit) to accommodate the prevalent strip residential development found there.

Zoning in the Study Area, therefore, permits a considerable variety of land uses from single-family homes to substantial industrial uses. The 1993 study of Birch Cove Lakes by Dillon Consulting Limited also noted that while those lands would be challenging to develop because of the rugged terrain and general lack of ground cover, the extensive waterfrontage and location relatively close to amenities could support premium prices.[8]

---

[8] Porter Dillon Limited, *Birch Cove Lakes Area Environmental Study*, June 1996,

HRM Development Department staff contacted in relation to this assignment indicated that there have been few development initiatives in the area to date. Some inquiries have been made concerning commercial/industrial expansion on lands abutting Bayers Lake Park and efforts have also been made to pursue residential development around Governors Lake (see **Section 3.3** following). The primary issues, apparently, are the difficult terrain, the challenges to building road access, the absence of water and sewer services, and the availability of more readily developable land inside Highway 102 and on the other edges of the Study Area (i.e., Timberlea, Hammonds Plains, and Bedford).

Under the second draft Regional Plan, which has been released to the public coincident with the preparation of this document, the Study Area is in the same general area identified as a future Regional Park. The Regional Park System as described in the draft Plan is to consist of Regional Parks, Provincial Parks, and Federal Parks. The draft summarizes the purpose of establishing the system as follows:

> The primary objective of a Regional Park will be to preserve and protect significant natural or cultural resources. The essential feature of a Regional Park may include, but not be limited to, open space, wilderness, scenic beauty, flora, fauna, recreational, archeological, historic or geological resources. A Regional Park will have sufficient land area to support outdoor recreational opportunities for the enjoyment and education of the public. The size of a Regional Park must be sufficient to ensure that its significant resources can be managed so as to be protected and enjoyed. Regional Parks may be federal, provincial or municipal properties and are intended to serve the educational, cultural and recreation needs of the population of the entire region as well as for visitors to HRM.[9]

The Regional Plan directly addresses the importance of intergovernmental cooperation in the management of these parklands:

> Many of the lands within the natural network are under federal or provincial jurisdiction. Private landowners and non-governmental organizations also have an important stewardship role in protecting the natural network. This Plan promotes the cooperation of other government agencies, private landowners, and non-government organizations to achieve good environmental management and planning that supports a more environmentally sustainable form of development in HRM.[10]

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[9] HRM, *HRM Regional MPS – DRAFT 2*, p. 30.

[10] HRM, *HRM Regional MPS – DRAFT 2*, p. 26.

Under the mandate of this study, additional areas may be considered for incorporation in the proposed Blue Mountain/Birch Cove Lakes Park depending on their natural qualities and established patterns of use.

It is also important to note that the Crown-held portion of the Study Area, which is by far the largest single holding, is not necessarily impacted by municipal policy and zoning. Although the Province is not legally bound by municipal bylaws, Provincial departments normally consider municipal planning documents before carrying out or authorizing any development in a municipal unit.

DNR has applied the Department's own integrated Resource management planning process to the area. The IRM process identified land features, land uses, and resource values that have been incorporated into the Department's planning and decision-making process for Crown land management.

In addition to the inventory of land features, land uses, and resource values, this phase of the process also included analysis of existing and potential resource uses; as well as consultation with the public, stakeholders, and other Provincial departments and agencies. This information was used by teams of DNR biologists, foresters, geologists, ecologists, and parks planners to classify Crown land into one of three categories:

- *Category 1 – "General Resource Use"* – Crown lands assigned to this category will be available for the full range of resource uses and include lands for which a low level of conflict among competing uses is anticipated.

- *Category 2 – "Multiple and Adaptive Resource Use"* – Lands with conflicting values for land and resource use would normally be assigned to Category 2 areas. The purpose of this category is to ensure that all values are taken into account in the planning process in areas where land use conflicts have been identified. Balancing the interests of all resource sectors may require that management practices for one resource use be modified in order to enhance compatibility with others. In some instances, critical values may be identified for overriding consideration in establishing management practices, whereas compromise may be the most appropriate approach in others.

- *Category 3 – "Protected and Limited Use"* – This category includes lands that are specifically allocated to special uses and where other resource activities may be very limited, modified, or denied. In most cases these lands are designated under legislation or are planned for designation.

Through the Department's management of Crown lands using IRM, resource management can proceed in Category 1 areas within the context of existing Provincial legislation and accepted best practices, whereas the Category 2 classification recognizes that special attention may be needed to reconcile conflicting resource uses.

Phase 1 of the IRM process completed in 2001, as well as subsequent work by DNR, has flagged Crown lands in the Study Area as having special values for scenery/viewscapes, significant wetlands, recreation/trail development, and lake/shoreline access.

3.3 LAND OWNERSHIP

The Study Area comprises 136 land parcels averaging 64 acres each, excluding properties in previously noted areas of urban development on its edges. Just under half of this land is in public ownership (47.8 per cent). The bulk of this is a 4,067-acre (1,650 ha) swath of Crown land (See: **Appendix A, Figures 1A** and **1B**).

There are also substantial private holdings, the majority of which are held by land development companies. The largest of these is 1,415 acres (575 ha) in the ownership of Annapolis Group that includes most of the Birch Cove Lakes waterfrontage. The second largest private holding is Parkhill Developments, which owns lands around Governors Lake. Other known development interests are noted in **Figure 1A** of **Appendix A**. Together, these owners hold 3,492 acres (1,415 ha) within the Study Area or 77 per cent of the privately held, undeveloped lands. Furthermore, Gateway Materials, which operates the Gateway Quarry on 225 acres (90 ha) near Kearney Lake, will undoubtedly seek to have their land developed when the quarry is decommissioned. Indeed, most of the landowners in the area can be assumed to be interested in long-term development potential as few properties are used for commercial purposes, and we are aware of no seasonal dwellings or private recreational developments in the area.

3.3.1 Private Lands

The major private landowners within the Study Area are as follows:

- Annapolis Group
- Barrett Lumber Company
- Gateway Materials Limited
- Kimberly-Lloyd Developments/Armco Communities
- Nova Scotia Power Incorporated
- Parkdale Developments Limited

- Piercey Investors Limited
- Sisters of Charity

Active use is the exception rather than the rule within the Study Area. Gateway Quarry is an ongoing aggregate extraction operation located in the northeast corner of the Study Area near Kearney Lake. Barrett Lumber Company has a forestry operation near Blue Mountain. Nova Scotia Power has a substantial right of way associated with a major transmission line that cuts through the Study Area to the south and west of the Birch Cove Lakes, as previously noted.

The remaining landowners, as stated above, appear to be holding their property for its long-term development potential. Annapolis Group, Armco and Kimberly-Lloyd, Parkdale Developments, and Piercey Investors are all well-established land development interests that are active adjacent to the Study Area and seeking to pursue opportunities within the boundary shown on **Figure 3.1**, above. The Sisters of Charity, although not a development company themselves, have well-positioned holdings within the area and are likewise pursuing development possibilities, likely in partnership with an established developer. In the past, the order, for example, sold land to Clayton Developments on which Clayton Park and Clayton Park West were built.

Private holdings predominate in the eastern portions of the Study Area, particularly around Susies and Quarry Lakes. The primary landowner in this area is Annapolis Group, which developed Glenbourne Estates/Langbrae Gardens to the east of Bicentennial Highway. Their holdings within the Study Area are long-standing. The company logged the land for many years, although they no longer take wood from the lands. As part of their past forestry operation they constructed several dams that regulate the water level in the lake system. The company has assessed the potential for development in the area including consideration of a roadway connection to Glenbourne Estates under Highway 102.

Annapolis Group is currently focused on planning the Bedford West area, which will flank the proposed Highway 113 corridor to the north of the Study Area. Company contacts interviewed for this assignment indicated that they would turn their attention to Birch Cove Lakes afterward. They expect development of the area to be predominantly residential with a local commercial component. Density and form will likely carry on the pattern established in Glenbourne.

The Sisters of Charity own lands farther to the south that abut Bayers Lake Business Park and extend to the southern shore of Susies Lake. EDM prepared a concept plan for commercial development of the Sisters of Charity land that was presented to HRM within the past year. The plan requires development of a connection to Chain

Lake Drive, the primary collector road in the Bayers Lake Park, and provides for improvements to the northwest off ramp at Exit 2A from Highway 102. It would also provide for a natural buffer of undeveloped land between proposed commercial component of the property and Susies Lake.

Parkdale Developments owns lands farther to the south around Governors Lake. Their lands are accessed from Trunk 3 within Timberlea. The lands were considered as an area for Master Plan development along with three other prospective areas for development in the HRM Staff Report of October 19, 2004. The report, however, stated that while the site "has good proximity to a regional employment centre at Bayers Lake, there are significant sanitary sewage and transportation issues associated with [its] development."[11]

The associated Piercey Investors, on the other hand, owns lands farther north and west, portions of which abut Maple and Frasers Lakes. The Highway 113 corridor also crosses Piercey lands at the point where it meets Highway 103. Pierceys has recently commenced an as-of-right residential development project on their lands. The project involves large lot single-family housing with on-site water and sewer services.

The Armco/Kimberly-Lloyd development at Kingswood has been one of the most successful in HRM in recent memory. The estate lot subdivision has marched steadily south and west from Hammonds Plains Road for nearly 15 years. It is now close to Blue Mountain. Their primary holding within the Study Area, however, is not contiguous with Kingswood. It consists of two substantial blocks amounting to roughly 300 acres extending west and south from the back property lines of existing homes on Kearney Lake across Charlies Lake and Fox Lake. Contacts with Armco indicated that they are interested in developing the lands in the near future in the context of the Bedford West Master Plan. No formal plans have yet been prepared by the company.

3.3.2 Crown Lands

Provincial Crown land covers the western and central portions of the Study Area. The entire Crown holding is under the administration and control of Nova Scotia Department of Natural Resources (DNR). Its management is primarily governed by the *Crown Lands Act* but is also guided by the *Forests Act* and *Wildlife Act*. DNR's management strategy calls for multiple use integrated resource management for the benefit of many varied stakeholders and interests. This includes such activities and features as outdoor recreation, aesthetic scenery, geology and minerals, wildlife species and habitat, and forests and forestry.

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[11] HRM Staff Report, "Master Plans and Greenfield Studies," October 4, 2004, p. 8.

The Crown land within the Study Area, as noted above, is an "area of interest" to the Department's park and recreation program. Further study will be undertaken in the future to define outdoor recreation opportunities. Consistent with the mandate of DNR these land use plans will be for natural resource opportunities. The lands have been identified for regional park designation under the proposed HRM Regional Plan. The Nova Scotia Department of Environment and Labour (NSEL) Protected Areas Division has also flagged the area for its exceptional wilderness features in a near-urban setting.

DNR staff state that DNR recognizes the IRM values of these lands, and does not sell or trade Crown land for commercial or residential development; however, some Crown lands will be required for the Highway 113 corridor. This will involve the transfer of administration and control of these Crown Lands from DNR to TPW. TPW will also have to acquire the private lands through which the corridor passes either through purchase/expropriation or land exchange.[12]

3.4 ENVIRONMENTAL VALUES

Notwithstanding encircling urbanization, the Study Area remains in a largely natural state. Some trails, logging roads, the Nova Scotia Power right of way, and dams built by the Annapolis Group to control the height of water in the Birch Cove Lakes system (i.e., Susies Lake, Quarry Lake, Fox Lake, Washmill Lake, and Charlies Lake) are the primary evidence of human impact.

3.4.1 Public Interest Group Values

Representatives of the Birch Cove Lakes Wilderness Society (BCLWS) escorted EDM team members through the area in early November 2005. According to a presentation by the President of the Society before the Bedford Watershed Advisory Board in early 2005, the group works toward retaining a natural area near the communities of Mainland North in Halifax so that residents can enjoy the outdoors, undertake recreational pursuits, and learn about nature and the environment.

The Society wants Crown-owned lands in the Blue Mountain/Birch Cove Lake Area designated as protected under the Provincial *Wilderness Areas Protection Act*.[13] They provided the following list of environmental features that the group values and they believe to be in the area:

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[12] Sale and/or exchange of lands between Provincial departments and between the Province and individuals or corporations is governed by the *Surplus Crown Property Disposal Act*, RSNS 1989, c. 452, and accompanying regulations.

[13] Bedford Watershed Advisory Board, Minutes, January 12, 2006, pp. 5-6, http://www.halifax.ca/boardscom/bwac/documents/050112.pdf.

- Last piece of publicly owned wilderness in this part of HRM
- Largest area without roads near the Halifax urban concentration
- Known populations of endangered mainland moose (Chebucto population)
- Contains 22 lakes and ponds many of which are entirely surrounded by public land
- Contains headwaters of the Kearney Lake, Papermill Lake, and Nine Mile River watersheds
- Diverse mosaic of ecosystem types, including numerous forest types (e.g., white pine, red spruce, red oak, yellow birch, white birch, poplar, red maple, black spruce, mountain ash), wetlands, barrens, aquatic areas, rivers, rapids, cliffs
- Presence of southern coastal plain flora species adjacent to sub-arctic alpine plants.
- Several stands of old-growth Acadian forests, including exceptional stands of old red oak, old red spruce, and old white pine (with understories of similar species compositions).
- Presence of a naturally rare stand of jack pine (fire dependent ecosystem)
- Presence of at least two rare granite barren ecosystems dominated by tolerant red oak species (red oaks usually occur in relatively nutrient rich areas)
- Numerous granite barren ecosystems, and associated rare arctic-alpine plants (e.g., Greenland sandwort (*Arenaria groenlandica*))
- Numerous wetlands with examples of bogs, fens, swamps, and shallow water areas
- Significant wetlands, including the "promised lands," Stillwater Run, and the lakeshore fens of the Birch Cove Lakes canoe loop
- Highest point of land in Metro Halifax ("Blue Mountain Hill")[14] with associated windblown treeless area and sub-arctic alpine plants
- Abundance of bird species, with 146 different species recorded by the Nova Scotia Bird Society (e.g., osprey, loon, bald eagle, blue heron, mourning dove, American kestrel, Swainson's thrush, pileated woodpecker, great-horned owl, cedar waxwing, etc.) owing to geographic location and habitat diversity. Many of these are breeders. Some are recognized as rare species.

Some of the stakeholders interviewed for this study to date have referred to the Study Area as Halifax's "Keji," in reference to Kejimkujik National Park in Southwestern Nova Scotia. Although the Blue Mountain/Birch Cove lands lack the drumlin terrain of "Keji," the comparison is not completely without merit. The Study Area and Keji both belong to the Atlantic Interior Theme Region as described in the *Natural History of Nova Scotia*. The Atlantic Interior Theme Region, however, characterizes most of the inland area of HRM (**Figure 3.2**).

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[14] Blue Mountain Hill is actually only the highest point on the Chebucto Peninsula. It is, nevertheless, a valued viewing point within the Study Area.

In general, environmental groups consulted asserted that Crown lands in the Blue Mountain / Birch Cove Lakes should be protected as a "wilderness area" under the *Wilderness Areas Protection Act*, or as a "nature reserve" under the *Special Places Protection Act*. NSEL administers both acts.

Source: Halifax Regional Municipality

☐ Approximate location of Study Area

Figure 3.2: Atlantic Interior Theme Region within HRM

3.4.2 Geology and Topography

The Study Area is almost entirely based on granitic bedrock, the second most common bedrock type found in the Atlantic Interior Theme Region (**Figure 3.2**). Granite is perhaps the most familiar geology to Nova Scotians. Granite is the fundamental structure of more than 50 per cent of the Atlantic Interior Theme Region. The coarse-textured rock includes a range of related but different rock types. It outcrops over an area of 10,000 square kilometres extending in a long bow from Yarmouth across to Blue Mountain / Birch Cove and beyond.

Granite is a hard, impermeable crystalline rock that is very resistant to erosion. Knolls and upland areas with a hummocky, boulder-strewn surface characterize the resultant landscape. Most of the soil parent material in Nova Scotia is glacial till, which is closely related to the underlying bedrock. Given the resistance of granite to erosion, overlying soils are thin and acidic with large areas of exposed bedrock as noted. The Blue Mountain/Birch Cove Area exhibits these characteristics. Substantial outcrops are found throughout the area, frequently rising 10 to 20 feet.

The granite landscape of the Atlantic Interior displays some variety of elevation, topography, and vegetation but overall has common scenic elements. Only occasionally throughout the Atlantic Interior does the land rise significantly above the surrounding area. One instance in the Study Area is Blue Mountain. Blue Mountain reaches a height of 150 metres in an area with an average elevation of approximately 100 metres. The summit of Blue Mountain is the highest point on the Chebucto Peninsula. No higher point intervenes to the south. It, therefore, offers long distance panoramic views southwards to the mouth of Halifax Harbour and northwards to Halifax International Airport (**Appendix A, Figure 8A**).

The surrounding forest is intermingled with exposed bedrock and barrens, and large glacially deposited boulders are found throughout. Plateau-like scenic vistas and intimate views at the edges of lakes are common. Generally, the value of the entire Study Area is greatly enhanced by the panoramic view from the summit of Blue Mountain. If not for the lakes and Blue Mountain, the granite areas would typically exhibit low to medium scenic value.

3.4.3 Watercourses

The irregular landscape and drainage of the Blue Mountain/Birch Cove area creates many lakes that add much to scenic value and recreational value. The Study Area straddles portions of the Nine Mile River and the Kearney Lake/Paper Mill Lake watersheds (**Appendix A, Figure 7**). The Paper Mill Lake watershed covers 3,500 hectares, while the Nine Mile River is a 12,000-hectare watershed system. The lakes and ponds in the Study Area are shallow with the largest, Susies Lake and Quarry Lake, being no more than 10 metres deep. Alternatively, where the granite bedrock outcrops are narrow and formed into ridges, deeper lakes such as Kearney Lake, which has a maximum depth of 28 metres, result.

The Paper Mill Lake watershed boundary extends within the Study Area from the summit of Blue Mountain and drains the southern exposure of the watershed that includes 16 lakes and ponds within the Study Area (**Table 3.2**). The Nine Mile River watershed portion of the Study Area is comprised of and bounded by the Kingswood Subdivision development to the northwest, and includes Cox Lake, Maple Lake, Fraser Lake, Lewis Lake, Ragged Lake, and Stillwater Lake. Together, lakes in the two watersheds cover 555.2 hectares or 12.9 per cent of the total Study Area. Surface waters in these lakes are generally dystrophic, having brownish acidic waters with a high concentration of organic matter, supporting only modest vegetation.

Primary productivity tends to be low and most lakes are oligotrophic, having low productivity, and being deficient in plant nutrients but rich in oxygen throughout their depth. Surface water also tends to be low in dissolved solids, providing little buffering capacity. Combined with the low buffering capacities of the thin soils and tills associated with granite bedrock, much of the fresh water in the Study Area is susceptible to acidification.

Lake or Pond	Area (Ha)	Area (ac)
Paper Mill Lake Watershed		
Ash Lake	30.0	74.1
Belchers Pond	2.5	6.2
Big Cranberry Lake	4.4	10.9
Big Horseshoe Lake	7.0	17.3
Charlies Lake	6.0	14.8
Crane Lake	12.0	29.7
Flat Lake	2.0	4.9
Fox Lake	16.0	39.5
Hobsons Lake	4.0	9.9
Kearney Lake	62.5	154.4
Little Cranberry Lake	1.6	4.0
Little Horseshoe Lake	1.0	2.5
Quarry Lake	45.1	111.4
Susies Lake	80.6	199.2
Three Finger Lake	6.5	16.1
Washmill Lake	8.2	20.3
TOTAL	**289.4**	**715.1**
Nine Mile River Watershed		
Cox Lake	87.6	216.4
Maple Lake	30.3	74.9
Fraser Lake	66.8	168.1
Ragged Lake	30.5	75.3
Stillwater Lake	49.5	122.2
TOTAL	**264.7**	**656.9**

Table 3.2: Waterbodies, Blue Mountain/Birch Cove Study Area

3.4.4 Vegetation

The Blue Mountain/Birch Cove Lakes Study Area is covered with patches of predominately softwood and mixed wood forest. Human disturbance of the landscape is widespread, and there are only a few small areas of mature forest left. For the most part, Red Maple, Aspen, and White Birch predominate as post-fire species. Red Spruce and Eastern Hemlock are found with Black Spruce and Balsam Fir. Black Spruce swamps and peat bogs are extensive. Species representative of Acadian forests are found in stands covering 2 or 3 ha, including stands of mature Red Spruce and mature White Pine.

Included in the reference mapping is a Forest Inventory map describing the area with 2,910.9 hectares of natural forested stands (**Appendix A, Figure 5A**). Wetlands including lake wetlands, open bogs, and treed bogs identified by NSDNR represent approximately 140 hectares of the entire Study Area (**Appendix A, Figure 4**).

3.4.5 Wildlife

Moose are present on the Chebucto Peninsula south of the Study Area.
Some stakeholders contend that they inhabit the Study Area. DNR, however, has stated that their records and surveys:

> … do not support claims that there continues to be a moose population in the Blue Mountain Crown land block. We believe the

> current level of development and transportation routes surrounding the block and utility corridors and recreational activities within, have significantly devalued the area as moose habitat. The occasional sighting has been reported in the area but these animals are felt to be transient. Although one of the values identified in this area, through DNR's integrated resource management process, was originally moose habitat, recent surveys have caused DNR to reassess this value for Crown land in this area.[15]

In an attempt to better understand the Chebucto Peninsula moose population, DNR fitted three moose cows and three moose bulls with GPS collars between January 2004 and March 2006. Analysis of this data will provide a better understanding of moose movement both spatially and temporally within the area and thereby assist future land use management, particularly with respect to connectivity and trail corridor analysis.

Deer are more common on the Chebucto Peninsula but avoid barrens and wetlands that are found throughout the Study Area. Nevertheless, new growth on recently forested and burned areas in the Kingswood subdivision provides good forage for moose and deer. As bogs and inland barrens are common, small mammal diversity is low, as should be expected. Beavers are notable at various locations within the lakes network.

Despite the many lakes and streams in the Study Area, the acidic and deeply coloured water supports only a limited population of freshwater fish.

3.4.6 Wilderness Corridor

The Blue Mountain/Birch Cove Lakes area occupies a strategic location as the connecting green space/wilderness area at the "pinch point" between approximately 22,000 hectares of undeveloped land on the Chebucto Peninsula and the greater mainland of central Nova Scotia. The pinch point of the Chebucto Peninsula extends approximately 18 kms between the Head of St. Margarets Bay east to the Bedford Basin, the widest section of the Blue Mountain/Birch Cove Lakes Study Area is approximately 10 kms across this same corridor leaving only 8 kms of land connecting the Chebucto Peninsula to the greater mainland (**Figure 3.3**).

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[15] Hugh Gillis, NSDNR, "DNR Comments on Blue Mountain/Birch Cove Assessment Study Situation Assessment Report," to EDM, December 22, 2005, pp. 3-4.

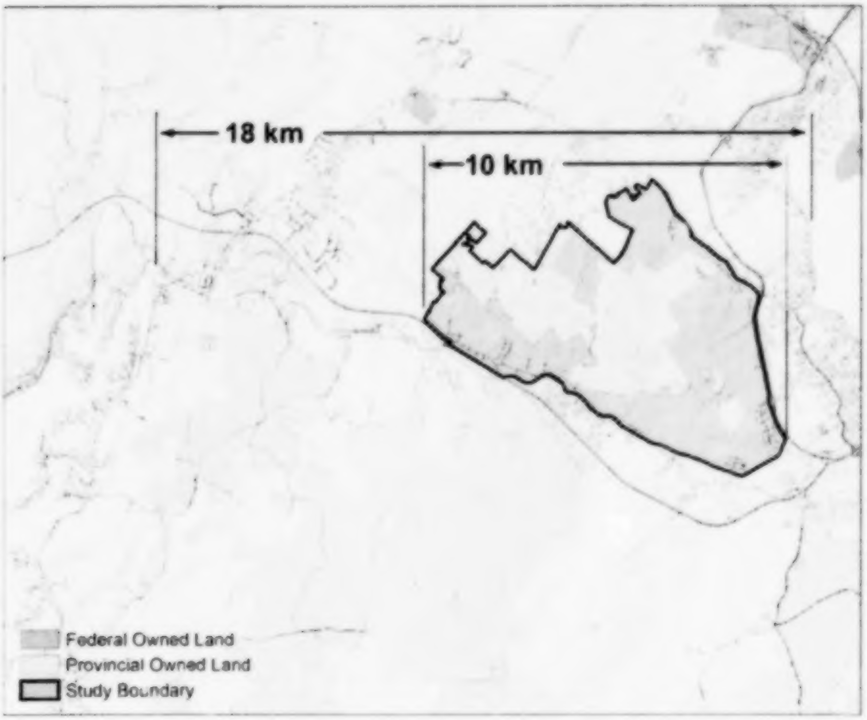

Figure 3.3: Wildlife Connectivity, Blue Mountain/Birch Cove Relative to Chebucto Peninsula

The Study Area location and its position at this "pinch point" make an examination of impediments to wildlife movement through the site necessary. Analysis of Landscape Connectivity found isolated areas of steep slopes along ridgelines (see: **Appendix A, Figure 6**); however, none of these steep areas poses a significant barrier to movement as they are not connected. There are also a number of wetlands as well as waterbodies comprising the Birch Cove Lakes system. The wetlands and lakes impede the movement of some species to a degree, but also provide important habitat and food supply.

3.5 RECREATION USE

Although much of the Study Area is rugged and difficult to traverse, its lakes and landscapes attract many users, especially from adjacent residential areas. The area is regularly used for recreation with well established, if unofficial, walking, hiking, and mountain biking trails (**Appendix A, Figure 9**). One informal trail, for example, leads from a well-known but informal parking layby on the western side of Highway 102 to Susies Lake, which is frequented as a swimming area. The lake system is attractive to canoeists and kayakers. The area also offers skating and cross-country skiing opportunities in the winter.

A variety of trails have evolved in the area as a result of the activities of these groups. As suggested in the preceding paragraph, these are generally unauthorized and informal. With exception of the BLT Trail, a Rails to Trails project undertaken by the Beechville/Lakeside/Timberlea community with assistance from HRM and the Province, no trail has a Letter of Authority from NSDNR recognizing the right-of-way for trails purposes. To the best of our knowledge, none of the trails on private lands within the Study Area is endorsed by any owner. Indeed, some of the remaining trails referenced below may threaten the preservation of existing natural values and will be evaluated in that light. Those that do not compromise the sustainability of the area, however, are important recreational resources that can be incorporated in a future regional park.

3.5.1 Hiking/Walking

Jim Vance, Executive Director of the NS Trails Federation, stated that his organization was a *de facto* "governing body" and that any specific knowledge or statement regarding trails would have to be addressed by the local association. In this case the local trail association is the Halifax Northwest Trails Association, which is represented by Bob MacDonald.

Several trails provide access to the Study Area. Well-established trails, for example, provide informal access to Quarry and Susies Lakes from Highway 102 to the south of Gateway Quarry. They not only provide access for vehicles that park at the edge of the highway but also correspond to trails serving residential areas on the other side of the Highway. In addition to providing opportunities for walking and hiking, these connections also provide access to the larger area by canoeists and kayakers, and campers. They are also the primary routes for swimmers who use Susies Lake in the summer. Anecdotally, they are also used to access the lake for skating in the winter.

At the northern end of the Study Area, the Kearney Lake trail runs on the south side of Kearney Lake behind Saskatoon Drive. It extends through Kearney Lake Estates at the northwest end of the lake and connects to an extensive web of trails through Blue Mountain Estates and Kingswood. The latter network, furthermore, includes trails from these residential streets that access the northern end of the Study Area, including Blue Mountain. It is valued for cross-country skiing and mountain biking (see below) as well as hiking. It has, however, been cut off to the west by the Blue Mountain subdivision. The Mainland North Trails Association has mapped the trail from Maskwa Canoe Club.

To the south, the BLT Rails to Trails Association has put considerable effort into the development of a nine-kilometre stretch of abandoned railroad bed through the communities of Beechville, Lakeside, and Timberlea. The nine kilometres of rail bed, currently managed by BLT Rails to Trails, begins at the Lakeside Industrial Park and runs through to the Lake of the Woods Subdivision at Exit 4 of Highway 103. The core trail managed by the Association serves the Beechville / Lakeside / Timberlea community and is a component of the Trans Canada Trails network. A variety of spurs branch northward from this spine to provide access to the core of the Study Area, including connection to the Nova Scotia Power right of way.

3.5.2 Cross-country Skiing

Steve Chipman, President of Cross Country Ski NS, contacted his approximately 200-person membership before meeting with EDM. Neither he nor his members had a good appreciation for the area. They tend to use existing formal developed trails, such as the Beechville / Lakeside / Timberlea Rails to Trails, Point Pleasant Park, Shubie Park, and Kings Road in Waverly.

He suggested that the Study Area is not heavily used. Skiers tend to prefer evergreen forests on rolling to flat terrain in areas with consistent snow coverage. Skiing on lakes is inherently unsafe. Barrens and open areas, which cover extensive portions of the Study Area, tend to be windswept and cold, and are not desirable. If trails are developed for skiing, they should have a system of bi-directional loops with no steep slopes or sharp turns, and multi-use structures such as warm-up huts.

3.5.3 Canoeing/Kayaking

Dr. Dusan Soudek, President of Canoe-Kayak Nova Scotia, indicated that the Birch Cove Lakes area is a highly valued recreational paddling resource. The group of lakes provides one of the few loop systems in HRM. He noted only three other loop systems: the Tangier–Grand Lake canoe route, the Mushaboom system, and the Blind Bay–Scotts Bay system.

The primary benefit of a loop route is that paddlers can put their vessel in the water and leave the water at that same location. The Birch Cove lake system, furthermore, is close to the city while providing a true wilderness experience. The convolutions of the lake system also sustain the interest of paddlers as they can visit the area many times to enjoy different experiences exploring new coves and inlets.

Dr. Soudek emphasized the importance of protecting the portage routes on the system noting that, "even if the land was developed you could still navigate the system if the portages were protected." He suggested that public ownership is the surest means of insuring portage areas continue to be available. He added that only immediate views need to be protected to preserve the wilderness character of the lake system(see: **Appendix A, Figure 8C**). He noted that the Canadian flag at Costco in Bayers Lake is currently the only intrusion into this experience and it is, nevertheless, beneficial to paddlers as an informal navigation maker.

3.5.4 Mountain Biking

The Study Area has two major mountain biking systems. The first and most heavily used system is the 5 km "Whopper Dropper" near Bayers Lake Business Park. It winds through brush and open barrens, and includes 3 to 4 foot high rocks offering jumping opportunities for the adventurous. The other is the "Evil Birch" trail system, which consists of a 10-kilometre loop accessed from the Maskwa Canoe Club on Kearney Lake.

Both trails are described and rated in the 2001 "Mountain Bike Trails for Halifax and Vicinity," which is printed independently by local enthusiast Randy Gray and summarizes the features of 30 separate trails in the region. Mr. Gray uses a fairly complex system to rate trails. Both the Whopper Dropper and Evil Birch trails include a mixture of easy and difficult sections. Because of the jumps, however, the Whopper Dropper is one of four trails in HRM that secured an "ambulance" symbol. Nevertheless, Mr. Gray's text suggests that it is well suited to novice riders, who will presumably know well enough to avoid the four-foot jumps. The Evil Birch trail is actually rated as more difficult overall but is evidently not as dangerous (i.e., a rider may be more likely to fall down but the fall is less likely to require medical attention). It appears to be regarded as a bit old fashioned with Gray stating, "Retro fun! This is what a Provincial Mountain Bike Race series course used to look like (minus the development)…this was THE place to ride…Oh how things have changed." Both the Whopper Dropper and the Evil Birch can be connected by a trail that follows the power lines through the Birch Cove Lake Blue Mountain area. Mr. Gray also includes an "Urban Development Alert" in his rating icons both trails to indicate that development is encroaching on them and riders should "expect to see some changes at some point."

Sue Earle, a founding member of the East Coast Mountain Biking Association, stated that her organization primarily uses the trails in the area for "Cross-Country Mountain Biking" or riding through the woods on a single track. Single track riding requires narrow (2 to 3 foot) trails. The "Whopper Dropper" is very well suited to the preferences of this group. It provides a variable level of challenge and is very durable because the granite bedrock barrens degrade slowly despite heavy use. In addition, Ms. Earle noted that the "Whopper Dropper" is close to the city.

3.5.5 Off-Highway Vehicles

The rugged terrain in the Study Area is challenging for motorized vehicles; however, it does attract some Off-Highway Vehicles (OHV). The BLT Trail is the only formal

OHV use trail in or around the Study Area. It is also used to some extent by snowmobilers in the winter. A spur running north from the BLT Trail, furthermore, connects to the Nova Scotia Power right of way, which provides a broad cleared area through which vehicles can traverse the Study Area to Kingswood.

The provincial associations for different types of OHVs (i.e., ATVs and snowmobiles) do not recognize these trails. The OHV public discussion forum reveals a desire for a trail linking Nine Mile River to the Mount Uniacke area where riders can access the more extensive trails network available for OHVs in the interior and central mainland. Currently, the Nova Scotia Power corridor can be used for this purpose but users are hindered by access problems across private lands in the Kingswood/Hammond Plains Road area.

In recent months the public debate on OHVs has been heightened by Provincial legislation (Bill 275) to better regulate their use. Over the same period, several complaints to DNR and the RCMP have resulted in tickets to OHV drivers exceeding the posted speed limit on the trail of 20 kph.

3.6 PROPOSED TRANSPORTATION IMPROVEMENTS

As noted in **Section 3.4**, the Birch Cove Lakes Watershed Society (BCLWS) considers one of the key features of the Study Area to be the absence of roads. On the other hand, roads, to a considerable extent, define the Study Area. Highways 103, 3, and 102, as well as the Kearney Lake Road are the most readily identified features on the edges of the area. Highway 102, in particular, has created a boundary that has protected the Study Area from intensive impact from development in Mainland North.

Proposed Highway 113, therefore, can be viewed as both a potential threat to natural values in the area and an effective barrier to future encroachment by development. First and foremost, it is important to understand that highway construction is not imminent. Its need is based on analysis by the Department of Transportation and Public Works anticipating increasing traffic levels on Highways 103 and 102. It will connect the two highways as shown on **Figure 1.1**, bypassing the most heavily used sections of the two roads within the Halifax urban core as well as the Hammonds Plains Road. By drawing users from more heavily used roads, it will also improve level of service (i.e., speed and safety) on those roads.

3.6.1 Highway 113 Project Description

Proposed Highway 113 is described on the NSTPW Web site as follows:

> The objective of this undertaking is to identify and preserve a corridor of land for a new highway in anticipation of future highway needs.
>
> The proposed Highway 113 would join Highway 103 near Exit 4 at Sheldrake Lake and Highway 102 near Exit 3 (Hammonds Plains Road). It is planned to be a four-lane wide median-divided highway, approximately 9.9 kilometres long. The right-of-way to be reserved for the highway is 150 metres wide.
>
> Access to the highway would be by high speed "flyover" ramps from eastbound Highway 103 and southbound Highway 102. An interchange and connector would be constructed at Trunk 3 near Exit 4 on Highway 103 and an interchange would be constructed at Kearney Lake Road. These interchanges will improve access to the 100-series highway network and meet the anticipated needs of expanding development in the area.[16]

No date has been fixed to begin construction of this link. The Department of Transportation and Public Works will monitor traffic volumes on the related roadways and will proceed with construction if and when the roadway is warranted. TPW staff interviewed by EDM have suggested that this could take 15 to 25 years or more.

Staff also emphasized that the current focus of their efforts is corridor preservation for future highway construction. The corridor to be secured is 150 metres wide. The highway itself from shoulder-to-shoulder will be approximately 45 metres wide. The Department has begun negotiations for land acquisition to establish the necessary right-of-way. Staff also wanted to address a misconception that Blue Mountain Hill will be quarried to acquire material for highway construction, *which has not been planned at any time*.

The Department recognizes the potential requirement for wildlife corridors and trail connections. It is very important from the perspective of highway safety that crossing occur at specific points on the highway. Staff indicated that data is being collected on the Chebucto Peninsula moose population movement in the area, and will be monitored for several years before the highway is built. The Department is also concerned that trails be accessible from trailheads on local and collector roads associated with development in order to avoid impromptu laybys along 100 series highways.

Under Section 22 (1) the *Public Highways Act*, a variety of activities are, in fact, restricted next to limited or controlled access highways:

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[16] Transportation and Public Works, "Proposed Highway 113," http://www.gov.ns.ca/tran/highwayops/Highway113.asp

22 (1) Where a highway or portion thereof or any land has been designated as a controlled access highway, no person shall, without a written permit from the Minister,

> (a) construct, use or allow the use of, any private road, entrance-way or gate which or part of which is connected with or opens upon the controlled access highway;
>
> (b) sell, or offer or expose for sale, any vegetables, fruit, meat, fish or other produce, or any goods, wares or merchandise upon or within forty-five metres of the limit of the controlled access highway; or
>
> (c) erect, construct or place or cause to be erected, constructed or placed, any building or other structure, or part thereof, or extension or addition thereto upon or within sixty metres of the limit of the controlled access highway.

Construction near a highway is further restricted under Section 42(1):

42(1) Subject to subsection (1) of Section 22 and unless the consent in writing of the Minister has been first obtained, no person shall erect, construct or place or cause to be erected, constructed or placed, any building or other structure, or part thereof, or extension or addition thereto, upon any highway or within one hundred metres from the centre line of the travelled portion of any highway.

These regulations, which can be modified or waived by the Minister of Transportation and Public Works as stated in the provisions, mean that a highway implies a substantial "no build/no access" area. These provisions enhance public safety. In the case of proposed Highway 113, they will also add to the buffering impact of the highway on any parkland dedication providing the Department with the ability to restrict building within a band up to 170 metres.

3.6.2 Environmental Assessment

Highway 113 was registered by TPW in April 2000 as a Class I undertaking, as required by the Environmental Assessment Regulations under the *Environment Act*. The registration included an environmental impact assessment, which was intended to address all assessment requirements. Based on public and regulatory comments on the registration document, TPW issued two addenda to clarify the original document and address comments. The project was briefly withdrawn and resubmitted in October 2004, in order to redefine the scope of the undertaking and remove a road connection between Trunk 3 (St. Margarets Bay Road) and the proposed Highway 113 from the project definition. In November 2004, the Minister issued a decision, based on possible adverse or significant environmental effects, that a Focus Report was required. This Assessment Study is intended, in part, to address the requirements of the Focus Report.

The April 2000 registration document was a detailed environmental assessment report. As such, it included:

- *Project Description* – Serving to describe the project sufficiently to identify the potential interactions with the environment, the description identified the location of the project, the locations of water crossings, the topographic setting, cut and fill areas, design standards, project schedule, pre-construction and construction activities and methods, and maintenance and operations activities. These included environmental protection measures to be included in the project.

- *Reason for the Undertaking, Other Methods and Alternatives to the Undertaking* – Addressing need and justification for the project and consideration of the methods, means, and locations that were considered in the decisions leading to the planned project. An important consideration stated for the registration of the undertaking was to ensure the acquisition and protection of the highway corridor in an area where private lands have been developing rapidly. At that time, TPW did not plan to construct the highway for 10 or 15 years; however, private development in the near term could preclude later highway construction.

- *Description of the Existing Environment* – Providing the environmental setting, which indicates the components of the environment that could be affected by the project. Terrestrial, aquatic, and wetland biophysical environment components were identified. Socio-economic and cultural environments were also identified.

- *Valued Ecosystem Components (VECs)* – Serving to identify components of the biophysical, socio-economic, and cultural environments of importance on which the assessment of impacts was focused.

- *Predicted Impacts* – Identifying potential impacts of the project on the environment shows how potential impacts will be mitigated and determines the significance of potential impacts, positive and negative. Potential impacts of the environment on the project were also addressed. Cumulative impacts as a result of interactions with the impacts of other projects were also addressed.

- *Compliance and Effects Monitoring* – Identifying environmental protection plans, environmental monitoring plans, contingency plans, and a compensation plan to prevent or mitigate impacts, and prevent accidental events or define the responses to accidental events that might occur.

- *Appendices* – An archaeological assessment and a wetland assessment were appended for these stand-alone studies.

The results of the impact assessment were summarized as advantages and disadvantages to the environment. Identified advantages include an increase in traffic safety and free flow of traffic between Highway 102 and 103, and a predicted reduction in congestion on Hammonds Plains Road, with an associated increase in safety. Associated benefits predicted were reduced travel times and reduced air emissions.

Negative predicted impacts included a loss of land development opportunities, interruptions in forestry operations, and losses of habitat from the area affected by highway development. These were not predicted to be significant with mitigation or compensation.

Other impacts to the biophysical and socioeconomic components were not considered significant as they were predicted not to cause a sustained depression or have an impact in excess of legislation or guidelines.

Following comments received from the public and regulatory reviewers of the registration document, TPW submitted Addendum 1 to the report in April 2001. The addendum was intended to clarify a number of topics and address comments. Notable topics addressed were:

- No Federal funding is expected for the project;

- Mapping of developed and developable private land indicates the rapid rate of development and the likelihood of development on private lands which would preclude construction of Highway 113, if the corridor were not established well before planned highway construction;

- Developers have modified their plans based on the publication of the plans for Highway 113, confirming the need to establish the corridor and identifying a need to resolve the issue, so that developers can proceed;

- The proposed highway would sever a portion of the Crown land to the west; however, private lands would also be severed that could be retained in an undeveloped condition; with the limited intrusion of the highway corridor on the Crown lands the impact on wilderness use of the Blue Mountain and Birch Cove Lakes areas would be minimized;

- Fuel savings and associated emission reductions would be significant; and
- Wildlife and recreation crossings would be addressed in the detailed design phase.

Further clarification was provided in Addendum 2 to the Registration, which was issued in June 2004, responding to the decision by the Minister of Environment and Labour that additional information was required. Addendum 2 addressed zoological species at risk, the population of mainland moose, wilderness recreation, and the effectiveness of the highway as a barrier to development.

Consultation with NSDNR indicated that the only zoological species at risk of concern related to highway construction was the population of mainland moose. Consultation with the Nova Scotia Museum indicated that there was no concern for zoological species at risk and no known species of fish, reptiles, or birds at risk in the area to be affected. The potential impacts and mitigation measures for the population of moose in the area of the highway was addressed in a report attached to Addendum 2.

A second attachment to Addendum 2 addressed the potential impacts of the highway on recreational uses. The report identified a variety of recreational uses in the area. The potential impacts on these recreational uses were predicted from the separation of the Crown land into two blocks and the limitation to access for recreational uses. With the provision of access via the highway overpass that will traverse the watercourse between Maple and Fraser Lakes, as well as a recommended underpass structure for recreational use to connect the Kingswood area to Blue Mountain, the impacts of the highway on recreational use were predicted to be not significant.

Addendum 2 reiterated that the 150-metre wide highway corridor would provide an effective boundary between private lands to the north and Crown lands to the south. Redesign of development plans south of Ragged Lake, in light of the proposed highway, was cited as support for the assertion that the highway would be a barrier to development. TPW concluded that from June 2004 the highway would be needed in 5 to 10 years, that the highway corridor is threatened by development, and the land must be secured in order to meet the coming need.

With the issuance of Addendum 3 by TPW in October 2004, the scope of the undertaking was changed. A connector road between Trunk 3 and Highway 113 was removed from the proposed undertaking so that construction of the road could proceed in association with the ongoing twinning of Highway 103 and to serve as a local road to allow a residential development to proceed.

3.6.3 Focus Report

The Terms of Reference (TOR) for the Focus Report required by the Minister of Environment and Labour was issued on December 7, 2004. The TOR states that the proponent (NSTPW) must submit the document within one year of receipt of the TOR. An extension has been granted in relation to this deadline and the report is currently required by March 31, 2006. Following submission of the Focus Report, the Nova Scotia Department of Environment and Labour (NSEL) has 12 days to publish a notice in the newspaper to advise the public where the Focus Report can be accessed for review and comment. The public then has 30 days in which to review the document, after which NSEL has 25 days to review comments received, and provide a Report and Recommendations to the Minister.

Under Section 18(a) of the *Environment Act* the Minister of Environment and Labour will have the following decision options, following review of the Focus Report:

i. the undertaking is approved subject to specified terms and conditions and any other approvals required by statute or regulation;
ii. an environmental-assessment report is required; or
iii. the undertaking is rejected.

The Focus Report is required to address a variety of concerns identified during the screening portion of the environmental assessment. This Assessment Study will specifically address concerns with the relationship between proposed Highway 113 and HRM's Regional Plan. In this regard, the Focus Report Terms of Reference require "examin[ation of] options for integrated/collaborative planning," in particular, as they relate to:

- *Transportation Corridors* – Describe how, or to what extent, Highway 113 is consistent with HRM's planning objectives for integrating transportation systems with land use and the environment.

- *Private Development*—Describe how, or to what extent, Highway 113 is consistent with HRM's planning objectives for residential and related commercial development in suburban and urban areas, including the Blue Mountain area and communities such as Bedford West.

- *Parks and Natural Areas Land Use* – Describe how, or to what extent, Highway 113 is consistent with HRM's planning objectives for regional parks and open space corridors in the Blue Mountain area and the vicinity of Frasers Lake.

- *Recreational Land Use*—Describe how, or to what extent, Highway 113 is consistent with HRM's planning objectives to provide opportunities for public recreational land-use in the Blue Mountain area and the proposed Bedford West community.[17]

One objective of the Blue Mountain / Birch Cove Assessment Study is to provide input to into these last two bullet points in the Focus Report, specifically information on Parks and Natural Areas Land Use and Recreational Land Use.

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[17] Nova Scotia Department of Transportation and Public Works and Nova Scotia Department of Environment and Labour, "Terms of Reference for a Focus Report," December 7, 2004, pp. 3-4.

4.0 LAND USE SUITABILITY

4.1 SUITABILITY ANALYSIS

Suitability analysis determines the fitness of land for supporting a specific land use. It is an interactive GIS modeling process that allows analysts to explore development options, protection criteria, and community and financial issues before any change in land use takes place. The input layers are composed of mapped information from various sources. Input data such as topography or forest inventory information are given values based on a ranked set of criteria or an equation. Layers of input information are modeled or ranked to produce a map showing the most suitable or important locations in relation to the attribute being considered. The process allows analysts to assess a variety of potential land uses from commercial development to residential development to preservation in a natural state.

The basic methodology involves the combination of GIS data management with multi-criteria decision-making techniques. GIS facilitates the assembly and presentation of essential data for assessing alternative locations. To assess the overall implications of the data, scores are assigned to the individual criteria being considered in a data layer. Data layers are then combined as appropriate to the individual model. The resulting overlay model provides an objective and repeatable assessment of the landscape. Put simply, the process is:

Layer 1 + Layer 2 + Layer 3 + Layer 4 + Layer 5 = Model Result.

To aid in the definition of the potential location of a regional park in the Blue Mountain/Birch Cove area, maps were prepared for a variety of designated attributes such as residential suitability and species richness. Model data represents a view of the area from the perspective of the characteristics of each attribute.

4.2 ATTRIBUTES FOR CONSIDERATION

The suitability attributes to be included in the modeling were determined through the collaborative efforts of HRM, TPW, DNR and EDM, and finalized during a charette held at the Halifax offices of TPW on January 13, 2006. While participants considered many characteristics, the final, agreed on list included the following:

- Cultural considerations
    i. Pre-contact archaeological potential
    ii. Geological resources
    iii. Other identified attributes (community stakeholders)
- Watercourse protection
- Residential suitability

- Species richness
- Views from core lakes
- Active recreation suitability

Each attribute was modeled to predict its importance in relation to the Study Area. GIS data used for attribute modeling was provided by DNR. Attributes documented in **Figure 4** of **Appendix A** were derived from interested stakeholders as well as DNR. This information was incorporated in the composite model.

4.2.1 Cultural Considerations

Archaeological Potential

The potential existence of pre-European contact archaeological sites was modeled based on proximity to watercourses, the slope of the land, and proximity to previously identified sites. In particular, archaeologists have identified watercourse intersections (where rivers flow into lakes or the ocean) as higher potential locations. Slope acts as a predictor insofar as that it determines areas that were suitable for campsites (i.e., areas with slopes less than 8 per cent). The model used to perform the analysis is the Pre-European Contact Predictive model that was developed for the Special Places Program of NSTCH, as well as HRM. **Figure 10** in **Appendix A** provides the model outputs, where areas of higher potential are in green and yellow. The area around the Susies, Crane, and Three Finger lake systems, and Stillwater Run in the central section of the proposed Highway 113 corridor range from moderate to high archaeological potential. Known archaeological sites were considered in the analysis, but have not been shown on Figure 10 as they are a confidential dataset protected by the Nova Scotia Special Places Protection Act.

Geological Resources

Geological data obtained from DNR used a fairly coarse scale. A more detailed analysis of the geological characteristics of the Study Area was not possible within the scope of this study. However, two key geological attributes were identified for potential cultural importance: the dimension stone quarry found at the eastern edge of Susies Lake and the amethyst deposit located in the northwest sector of the Governors Lake system. **Figure 4** of **Appendix A** highlights both as points of interest. They were included in the final composite model.

Additional Interesting Features

Figure 4 of **Appendix A** also highlights interesting features identified as potential park attributes. Features such as interesting forest stands, unique flora and fauna, natural beaches, rapids, and cliffs were identified and mapped. These features were given a 30-metre buffer representing a minimum setback to provide a natural context to the features, and included in the final composite model. These features were almost all included within the proposed park area because they represent the most interesting natural features for enjoyment by the public.

4.2.2 Watercourse Protection

The watercourse protection model evaluates the sensitivity of land to produce erosion as well as the potential of that erosion to reach a receiving watercourse. The primary development-related threat to watercourses is sedimentation resulting from soil erosion.

To assess the potential impact of sedimentation, the model divides the Study Area into land cells. It measures the erodability of each cell through application of the Universal Soil Loss Equation (USLE) assuming that vegetation has been removed from the land as will normally be the case in the development process. A Sediment Delivery Ratio map is then applied over the Study Area. The delivery ratio evaluates the potential for eroded soil to reach a particular watercourse. The model is authored by EDM for Environment Canada and the Government of Newfoundland and Labrador who subsequently published it in the *Watershed Management Plan for Gander Lake and Its Catchment*, February 1996.

The model also accounts for the sensitivity of receiving water bodies to the impacts of soil erosion. For example, a cell with a high potential for soil erosion that drains to a marine system could be designated as less sensitive than a cell that has lower erosion potential but directly impacts a wetland.

Figure 11 in **Appendix A** provides a visual summary of the areas within the Study Area that are key to watercourse protection. Areas in green and yellow identify lands with high erodibility with the potential to impact on sensitive waterbodies. Concentrations of sensitive land are notable around the river systems associated with Frasers and Ragged Lakes. Mitigation measures should not be required.

4.2.3 Residential Suitability

EDM has developed the residential suitability model over many years to support planning and development projects. Residential suitability is a function of the desirability of the area based on typical residential preferences and the feasibility of land development. Factors influencing desirability are vegetation cover, quality of view planes, and south facing slopes. In addition, areas of hardwood or mixed-wood stands tend to be more desirable for residential development than softwood stands, scrub, barrens, or marshland.

Development feasibility is related to till thickness, soil drainage, terrain (i.e., slope), and erosion potential. Till thickness and soil drainage are important considerations for unserviced residential development as they influence the suitability of the lands for installation of wells and on-site sewage disposal systems. In addition, such areas of thin till require the import of topsoil as part of the development process and afterwards as part of typical suburban landscaping. Such soils tend themselves to be highly erodible and pose a threat to watercourses.[18]

Some areas with high scores for all other factors were designated as low potential for residential development because of these feasibility factors. **Figure 12** in **Appendix A** illustrates low potential in much of the eastern half of the Study Area. Much of the area is characterized by bedrock with a thin till cover making the installation of on-site sewage disposal systems costly.

4.2.4 Species Richness

The Species Richness model was developed by EDM for the Big Cove First Nation in New Brunswick during the course of a community planning project. The model is published by Kluwer Academic Publishers in the 2003 text *Landscape Interfaces – Cultural Heritage in Changing Landscapes*. **Figures 13** through **16** in **Appendix A** present the potential species richness of the Study Area broken down by three animal-type habitats: mammal (**Figure 13**), bird (**Figure 14**), and reptile/amphibian (**Figure 15**). Considerably more bird species are, however, present within the Study Area than mammal species, and mammal species, in turn, outnumber reptile/amphibian species. To adjust for this factor, species richness was scaled into the five categories provided on the respective maps for each group so that, for example, areas with 5 to 6 reptile/amphibian species were treated as equivalent to areas with 19 to 27 bird variants. The final species richness figure (**Figure 16**), consequently, portrays ratings that are the average of ratings for the three animal groups.

For the purpose of the species richness modeling, data was derived from species models developed for New Brunswick where individual species were associated with specific habitat/vegetation types. While the species and habitats in HRM are similar to those found in modeled areas of New Brunswick, the accuracy of this assumption has not been field verified.

4.2.5 Views from Lakes

This model assessed the preservation of natural views experienced from canoe routes identified by canoeing organizations that frequent the area. Areas within view planes along identified canoe routes were highlighted as sensitive to development that could disrupt the natural setting preferred by wilderness enthusiasts.

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[18] The 20-metre watercourse buffering proposed pursuant to the Regional Plan is intended to mitigate this type of impact. Nevertheless, the mobilization of sediment is a by-product of nearly all development processes and cannot be completely prevented by screening and buffering.

Canoeists did state, on the other hand, that views of development and human activity were acceptable (and in fact desirable) at the launch areas. In these situations visible areas of human use provide a sense of safety as opposed to parking and deploying in a remote, isolated area with no surrounding communities to go to in the event of an emergency. **Figure 17** of **Appendix A** provides the model output where the intensity of the green reflects areas that are visible from the lake.

4.2.6 Active Recreation Suitability

The model used to generate the active recreation suitability map (**Figure 18** of **Appendix A**) is largely based on the appropriateness of lands for natural areas hiking (i.e., accessible without the need to construct trails). As such, surface cover is an important component to determine the ease of use. Surface cover such as wetlands, granite outcroppings, or low scrub was less desirable due to the obstacles such terrain poses to hikers.

Landscape topography was included to account for the desire of hikers for undulating terrain with a minimum of steep hikes and extended flat areas. Vegetation cover and proximity to existing roads provided a model of likely preferred walking areas. Hikers prefer hardwood or mixed woods stands to barrens, marshes, or softwood stands, and generally try to avoid roadways, particularly those that may be frequented by motorized vehicles. This modeling addresses pathways as opposed to destinations such as Blue Mountain Hill. Special viewing points, beaches, and other areas of interest are identified on **Figure 4** of **Appendix A** portraying Interesting Area Attributes.

4.3 USING THE MAPS AND MODELS

4.3.1 Accuracy of the Maps

The value of the evaluation models is directly correlated to the quality of the input data. This study had a limited field program. Data incorporated in the models was provided to EDM from government sources and was not field verified. The biggest data input weaknesses arose from the coarseness of the data or the difference between the intended use of the data and its integration into the models described above. For example, soils data used in the USLE equation was refined for agricultural purposes and was not specifically developed for use in erosion modeling. Forestry data was developed primarily for use with forestry management practices. This may have an influence on the accuracy of the maps. Prior to detailed concept development of the Park, field truthing of the data will be essential.

4.3.2 The "Model Composite"

The results of each individual suitability model described in the previous Sections provide information on key landscape characteristics considered desirable within the park. Each model portrays where these features can be found in the landscape. Obviously, a successful park will include many areas with high parkland suitability. The Model Composite is a combination of all of the models created without applying any weighting to any individual feature. Areas portrayed as yellow in the Model Composite have the more of the attributes considered desirable for the Park than those portrayed in purple (refer to **Figure 19, Model Composite,** in **Appendix A**).

The Model Composite is a useful test of any proposed configuration of the future Park, as it should include primarily areas that embody the desired attributes.

4.3.3 Using the Maps and Models to Define Parkland Area

The primary purpose of each individual attribute model is as input to the overall parkland area planning process. How the model is used depends upon the overall design intent to be achieved.

For example the entire land area within the primary viewshed of the Lakes defined as the Core Lakes (Ash Lake and Fox Lake) were included within the ideal configuration area, in order to provide a primarily wilderness experience to canoeists in this location. However, for Susies Lake and Quarry Lake, which are proposed to have the greatest public use, the viewshed was used differently. For these lakes, visibility of some development areas was considered a benefit because it would provide surveillance at access points and launch areas.

The design intent is described in the follow chapter, as well as additional detail on the use of the models in developing the recommended area for inclusion.

5.0 PARK CONFIGURATION

5.1 PARKLAND VALUES

The Blue Mountain/Birch Cove Lakes area is valued as a wilderness landscape. The interviews undertaken as part of this study suggest that the Blue Mountain/Birch Cove Lakes area has captured the imagination of HRM residents.

The unique aspect of this particular wilderness is its location. The study area offers a wilderness experience immediately adjacent to a densely developed city. It is a large patch and as such provides many large patch features, including quietness, aesthetic beauty, species diversity and richness, as well as interesting elements and forest stands in an urban context where these attributes are rare. The proximity of this wilderness enables people to experience the wild landscape on a daily basis. It provides users with a rugged and accessible Canadian experience of water, birds, and extensive forest.

The results of the landscape assessment suggest that the study area, while special as a wilderness assemblage, does not rank as outstanding ecologically at a regional or provincial level. There are no known significant or rare landscape elements within the Study Area that suggest the overall property should receive protection for its ecological merit. There are also no individual elements, which if not included, would greatly diminish the ecological value of the park.

That said, the suitability model results do suggest that some locations in the study area embody more of the defined park attributes as described in **Chapter 4.0** of this Final Report, than other areas. The **Model Composite (Figure 19, Appendix A)** is a simple combination of all of the park attributes without any weighting applied. Areas portrayed in yellow in this map offer more park features than those shown in purple. A successful park area will include many of the areas that are highly valued for parkland development.

The suitability analysis results also indicate that the area is extremely resilient. Thin soils and hard bedrock that limit the development potential of the area, also make the landscape resistant to recreational uses. The area offers a significant wilderness experience for people in an area that is durable enough to support the impact. The two most valued landscape experiences are Susies Lake and Blue Mountain. If undertaken carefully it will be possible to develop these and other areas for human recreational use while retaining their essential wilderness attributes.

These values suggest the following with respect to determining the most appropriate park configuration: 1) a large intact patch should be preserved that is isolated from development; 2) provided there is a large patch, there are many equally good options for the final demarcation of the park boundary; 3) and Susies Lake and Blue Mountain should both be focal features of the park.

5.2 ROLE OF THE PARK

Municipal parks are normally set aside to provide areas for recreational activity and landscape enjoyment by residents and visitors. By contrast, many Provincial and Federal parkland areas have been set aside primarily to protect rare and endangered species and / or to preserve unique landscapes. Similarly, while people and their activities are typically preeminent in planning Municipal parks, human activities may be limited in Provincial and Federal parks to protect ecological integrity.

As people become more environmentally aware, their ideas about the ideal landscape for recreation as well as their preferred outdoor activities change. Today, while active sports and "green grass parks" are still popular, walking, hiking, and bird watching in natural settings rank among the highest valued recreational activities. Mountain biking, canoeing, and kayaking are also enjoying a rise in interest. That some of the most popular recreational activities occur in natural settings suggests the need for and role of this Municipal park.

The role of a Municipal wilderness park is to provide residents with a fulfilling natural experience that can occur daily within a relatively safe and secure situation. These aspects, daily contact and a secure situation, set the municipal wilderness park apart from its provincial and federal counterpart. A walk in nature can take place in a location that is still just a few minutes away from a local store or community. Local camping can take place minutes from the hospital, and experiences gained here can be an excellent step towards wilderness treks for those who through this experience become more adventurous. The park can be an excellent location to learn to canoe or kayak, and good place for family water sports because if you tip, there will be someone nearby to help. Similarly rock climbing and skating can take place in a wilderness where you can quickly get help if you hurt yourself or get too cold. The Municipal wilderness park can also provide natural experiences for those who often are unable to access them, including the young, the elderly, the infirm, and the poor. Opportunities for these individuals and their particular circumstances should be a highlight in the park.

The role of the park in providing regular, daily exercise suggests that the park area selected should be highly accessible from new and existing communities, with many access locations, and opportunities to arrive using a variety of transportation modes, including walking, hiking, bicycling, in-line skating, public transportation, automobiles, canoes, etc.

The role of the park in providing a secure wilderness experience suggests that areas where the most intense recreational uses are planned to occur should be immediately adjacent to areas that have existing or planned community development. This will allow the future park design to incorporate CPTED (Crime Prevention Through Environmental Design) principles in the areas most heavily used by people. CPTED, described in more detail below, involves the design of buildings and open spaces to enhance human safety. The principles that guide CPTED include natural surveillance, reinforcement of territory or "defensible space," access control, and the provision of alternative routes. Applying CPTED will require the selection of a park area that is adjacent to development and accessible by emergency vehicles.

5.3 LANDSCAPE CONNECTIVITY

The Study Area is between two extensive wilderness areas. The Terrance Bay Wilderness Area, provincial parklands, and other Crown, Municipal lands on the Chebucto Peninsula south of Highway 103 are extensive and home to wide ranging species including moose and bear. Similarly, extensive interior lands owned largely by Bowater Mersey and the Crown provide wildlife habitat to the north of the Hammonds Plains Road.

The presence of moose and bear within the Study Area is the subject of debate. Regardless of the current situation, both species were formerly in the Study Area, and both are definitely present in the wilderness areas to the south and north. In terms of landscape connectivity, the Study Area offers three key opportunities to facilitate wildlife movement between these two large wilderness areas. Other than these locations subdivision development has largely blocked paths available to wide ranging species.

The three "corridors" that link the Chebucto Peninsula wilderness with the Bowater Mersey lands north of the Hammonds Plains Road correspond to three exits from Highway 103 (**Appendix A, Figure 20**). The first is at Exit 3, where the Nine Mile River offers a corridor. When the planned Westgate community is complete, a 300-foot wide buffer next to the river is anticipated to remain that could provide wildlife passage. The second is at Exit 4 where existing rail cuts and trail development offer a passage. The third is Exit 5 where extensive Bowater Mersey lands to the west of the Tantallon Shopping Centre and Westwood Subdivision offer good habitat and encourage passage. TPW is currently working with DNR to collect data on species movement in these areas. The decision on the need to link these two large tracts, and the possible role of the park area in establishing this link, will be made when this data is available.

It is important to note that while it may be determined in the future that connectivity is not be required at a provincial level of concern between the two large Crown parcels, the proposed Blue Mountain/Birch Cove Lakes Park should still be connected to adjacent resource lands. This connectivity is necessary to maintain the diversity and species richness within the park boundary. As human use of the park intensifies the pressure on individual species will increase, and many species will slowly die out if there is not a ready population that can easily re-populate the park on a regular basis. In addition, without connectivity the genetic pool within the park may become limited over time for species without a sufficiently large population. Connectivity also helps the park be more resilient to disturbances such as a fire, hurricane or other natural disaster. Maintenance of species diversity within the proposed park area over the long term will likely require connectivity to at least one resource area and preferably two.

Connecting the park to resource lands could require management control and/or acquisition of critical parcels in the area between Timberlea, Kingswood, and Hammonds Plains, as indicated in **Figure 20** of **Appendix A** entitled **Connectivity**. The figure also indicates areas where TPW might consider species movement in future highway design to aid the connectivity of the park to the greater landscape.

5.4 PROPOSED PARK AREA

Figure 5.1 illustrates a proposed generalized area for the Blue Mountain/Birch Cove Lakes Park. The generalized park area, comprised of the Core Wilderness Area and Active Use Area, is an example of an ideal park area that was developed as part of this study to illustrate the principles and provide one option for more detailed discussion.

The generalized park area was derived using the suitability model results from **Chapter 4** of this Final Report, and considering the previous discourse on park values, the role of the park, and connecting the park to the greater landscape. The generalized park area described and the principles embodied are necessary to a successful wilderness park. That said, the final shape of the park boundary as shown is but one option. As indicated earlier, given the park values and the role of the park, there will be many equally good options for the final boundary demarcation that can and should be determined at a future date.

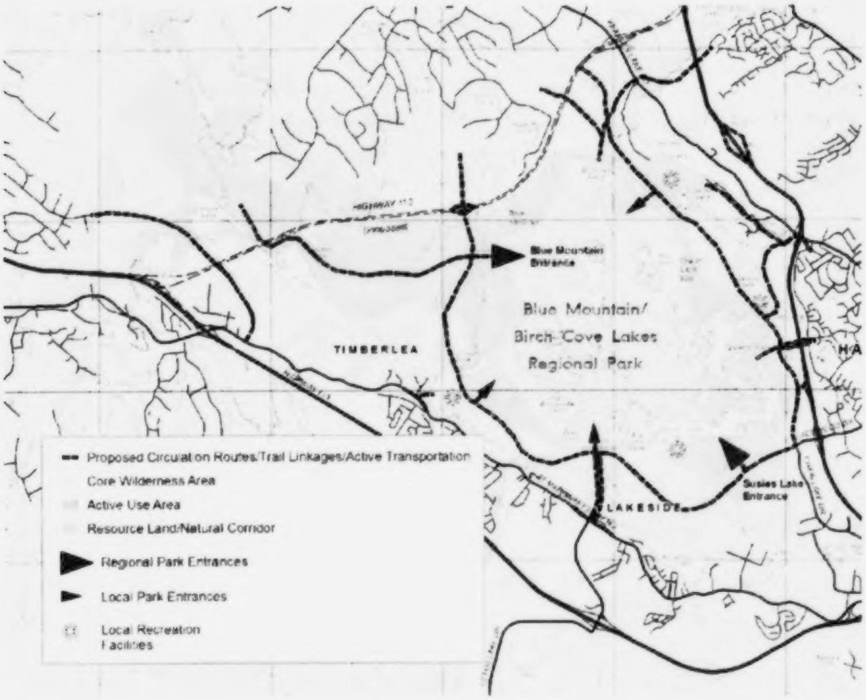
HIGHWAY 113
Blue Mountain Entrance
Blue Mountain/
Birch Cove Lakes
Regional Park
TIMBERLEA
LAKESIDE
Susies Lake Entrance
HA
Proposed Circulation Routes/Trail Linkages/Active Transportation
Core Wilderness Area
Active Use Area
Resource Land/Natural Corridor
Regional Park Entrances
Local Park Entrances
Local Recreation Facilities

Figure 5.1: Proposed Blue Mountain/Birch Cove Lakes Park

The area proposed for the park includes the following elements: 1) a Core wilderness area that is silent and isolated; 2) a surrounding area of Edge wilderness that is the focus of wilderness recreational activities; 3) a meaningful landscape corridor connecting the designated park area to the extensive Crown holdings beyond; 4) an area of community development around and interspersed with the Edge landscape of the park that is designed in a manner to implement CPTED principles; 5) at least one and preferably two significant regional access locations; and, 6) linkages to all of the surrounding communities including active transportation initiatives.

5.4.1 Core Wilderness Area

To truly be a wilderness park, the park area should encompasses a significant core wilderness area that is in fact remote and supportive of the primary human values attached to a quiet and deep woods. The area should be large enough to include a full day walk on foot in an atmosphere that feels isolated. The area should be made visible, for example; its expanse might lie before the viewer from the top of a hill, but it should not necessarily be easily penetrable (e.g., access should be by significant walking paths, canoe routes or mountain bike trails). The Core area should include a variety of landscape types, and serve as a seed source and refuge from the more heavily used areas of the park.

In **Figure 5.1** the proposed wilderness Core area is shown in blue. The Core area is approximately 4 km long by 2.5 km wide, and is sufficiently large to support a 20 km loop trail for "back country" day hikes. The proposed Core area also includes a favoured day long canoe/kayak loop route originating at Susies and Quarry Lakes, and encompassing Fox Lake, Ash Lake, Crane Lake, Three Finger Lake, Big Horseshoe lake, and Big Cranberry Lake. The viewsheds from these "back country" lakes (**Figure 17** in **Appendix A**) were wholly included in the core area, ensuring minimal disruption of the natural setting preferred by wilderness enthusiasts.

The proposed Core area also includes a wide variety of landscape types and at least three areas that offer the potential for high species richness for each of the three animal groups modeled (i.e., mammals, amphibians, and birds), as per **Figures 13** through **16** in **Appendix A.** Finally Quarry Lake Hill was included in the core wilderness area. While it is proposed that Blue Mountain be developed for more intensive recreational use (see below), the south facing view from Quarry Lake Hill out over the core wilderness expanse is proposed to be saved for wilderness enthusiasts seeking a remote, quiet and contemplative long view.

Access to the Core wilderness area should be entirely through the surrounding Edge wilderness area. In this way, the Edge landscape provides a buffer zone to the Core landscape, keeping the Core quiet and protected, and allowing the Core to serve as a seed source and refuge for species living in the Edge landscape.

5.4.2 Edge Wilderness Landscape

The Edge wilderness landscape is a band of wilderness that ranges in depth from approximately 100 to 1000 metres surrounding the Core landscape. The Edge offers extensive opportunities to experience the wilderness on a daily basis. Because of the adjacent Core, one side of the Edge landscape is always quiet and offers a sense of the remote woods beyond. Simultaneously, the Edge landscape should be sufficiently narrow and interspersed with community development such that CPTED principles may be applied during its development; quite literally, help should be just a stone throw away. The Edge landscape should encompass the cherished locations of the study area as well as landscapes that host the wilderness species best loved by people, including birds and small mammals, making them accessible for human enjoyment.

In **Figure 5.1** the proposed Edge wilderness area is shown in green. The Edge includes both Blue Mountain and the southern, eastern and northern sides of Susies and Quarry Lakes. These areas are proposed to be key recreational areas in the park.

The viewshed from Blue Mountain is included in the Core area, however the hill itself is contained within the Edge landscape. This will allow Blue Mountain to be enhanced as a significant recreational area, with views out to the extensive forest area of the Core. Short hikes, rock climbing, and picnic areas should be included, and limited commercial opportunities considered during detailed planning. One might imagine bicycling to the top of the hill, and then eating Blue Mountain huckleberry ice-cream from a bench overlooking the wilderness Core while rock climbers ascend the slope below you. Mont Royal in Montreal, Quebec and Cadillac Mountain in Bar Harbor, Maine offer precedent for detailed development. Access to the hilltop should allow even the elderly and the infirm an opportunity to experience the view.

The Edge landscape bordering Susies and Quarry Lakes may be developed as the primary recreational areas. An ideal minimum 100 metres of land width should surround each lake, ensuring the experience remains natural. Activities including bicycling, in-line skating, skate boarding, ice skating, swimming, canoeing and kayaking, pedal and row boating, outdoor picnic areas, running and hiking trails, should be included throughout. The Edge landscape should include a continuous multi-purpose trail system that also provides for half hour and one hour trails that loop back to the starting spot. One can imagine bicycling or walking from Clayton Park, under the highway to a trail along Susies Lake. Along the trail, one can stop for a rest and watch the canoe races as well as the baby ducks that are visible along the Core wilderness landscape on the other side of the Lake. While walking through the Edge landscape one is occasionally aware that homes and community facilities are nearby, providing a level of surveillance and security to the route.

Opportunities for incorporating specific wilderness recreational facilities, such as an "adventure" mountain bike trail area or equestrian trails, should be considered during detailed planning stages. At individual community access locations there may be opportunities to include specific community recreational facilities that are needed to fulfill local needs. The Edge wilderness landscape should also be supportive of the park activities related to the Core area of the park, notably parking/staging areas for paddlers to bring their canoes and kayaks, or for skiers and hikers to park. The Crown parcel on Susies Lake and near the Bayer's Lake Business Park offers an excellent opportunity for the primary staging area for water based activities within the entire park area.

The Edge area also includes a large number of "Interesting Area Attributes" (**Appendix A, Figure 4**), such as interesting forest stands, dams, unique ground flora, and geological resources. During detailed planning, these and other features that are identified during field work, should be incorporated into the Edge area as special park features for interpretation and interest. The Edge area should also include a large number of locations that are potential habitat for birds, amphibians and small mammals, as identified in **Figures 13** through **16** in **Appendix A.** Shrub planting and clearings should be included and created to improve bird and small mammal habitat.

Some Edge wilderness lands on the western side of the generalized park area corresponding to Stillwater Run should remain as a natural transition to the corridor/resource lands to the west of the park.

5.4.3 Natural Corridor

The Crown and private lands lying to the south and west of the generalized park area form an important natural corridor, providing connectivity to the more extensive Crown and Bowater lands to the south and west, refer to **Figure 21, Generalized Concept Plan**.

A critical link in this corridor is at Maple Lake/Frasers Lake where the proposed Highway 113 corridor crosses the lake system. The highway will be located on one of the few remaining "necks" of land available for species movement. The Piercey Investors subdivision development on their lands to the west of the lakes may present a significant complication for this initiative. HRM should work with landowners, TPW, and DNR to ensure the preservation of adequate connectivity in this area, consistent with the Open Space Functional Plan proposed in the draft Regional Plan.[19]

The resource land areas encompassed by the natural corridor may also provide important hiking and canoeing links to the Tantallon and Hammonds Plains areas. These trail linkages should be designed to follow CPTED principals, particularly where they cross the proposed Highway 113. Resource management of these lands, as currently undertaken by DNR, and including forest harvesting, is compatible with the objective of a natural corridor for the park.

5.4.4 Adjacent Community Development and CPTED

In order for the wilderness experience to be secure, facilities and services must be nearby. The basic and overlapping principles that guide CPTED in practice are: natural surveillance, reinforcement of territory or "defensible space," access control, and provision of alternative routes.[20] The implementation of CPTED will require an area of community development adjacent to the wilderness park area.

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[19] HRM, *Regional MPS – DRAFT 2*, p. 39. Specifically, the plan states, "The Open Space Functional Plan should consider: coordinating and managing a program to research and identify potential natural corridor linkages, community networks and significant natural habitats to guide considerations of future development." It follows by stating, "[The Open Space Functional Plan should consider] coordinating and managing a program to research and identify potential urban corridors for the restoration of natural corridor linkages, community networks and significant natural habitats to guide considerations of future development."

[20] See: City of Vancouver, "Designing Safer Urban Environments," http://www.city.vancouver.bc.ca/commsvcs/planning/infobul3.htm

The study area boundary is primarily 100 series highways and roads. While these major highways and roads have served to protect the study area from development encroachment, they also restrict the visibility and accessibility of the study area.

In order to improve security in the park, a zone of community development should be considered between the major highways and roads that border the Study Area and the proposed park area. This development would take place on privately held lands. Residential neighborhoods extending inward from the Bicentennial Highway, Kearney Lake Road, Hammonds Plains Road, and St. Margarets Bay Road will provide many new users for the park including people who take a pride of ownership and offer surveillance for safety and security. Furthermore, these new residents can largely be expected to be park users whose sense of ownership can be relied on to assist in the management of its space.

The relationship between community development and a wilderness park is complex and inter-related. In order to provide a wilderness experience, development cannot feel like it is impinging on the park, and yet it must be accessible. Therefore, the recommended shape of the boundary of the Edge wilderness area is a curvilinear shape that is interspersed with areas of community development. The final boundary location should be determined while simultaneously considering the ideal community build-out such that both the park and community perform well. Supporting commercial operations, such as kayak rental facilities and food service shops might be included in the community areas that develop adjacent to the park. Detailed planning should consider, where possible, a public street frontage bordering the park as opposed to the backyards of homes. Point Pleasant Park Drive provides such an example, creating a very public and secure interface between the south end neighbourhood and the Park.

5.4.5 Regional Entrances and Park Roadways

The proximity of the park to the Provincial highway system can facilitate access where it is provided for. It is recommended that at least one and preferable two regional park entrances be developed to provide convenient access from the Highway system. In **Figure 5.1** a regional access is provided near the Bayer's Lake Business Park at the Lacewood Interchange on the Bicentennial Highway. This regional access location is very near the primary staging area proposed for the Crown parcel to the south of Susies Lake.

A second potential regional access location is near Blue Mountain on the future Highway 113. Possible HRM plans for an interchange at Kingswood/Hammonds

Plains could be combined with a regional access to the park. Like the Lacewood interchange, access in this location would be immediately adjacent to one of the most important park areas, Blue Mountain itself.

The generalized park plan in **Figure 5.1** also suggests the possibility of a circulation route around the park connecting the two regional entrances and providing multiple minor points of access to the park.

5.4.6 Park / Community Access

The limited access highways that flank the Study Area have had a significant role in restricting access. Highway 102, in particular, has inhibited the flow of potential users from areas such as Clayton Park West, Glenbourne Estates, and Rockingham Ridge, which now accommodate a large population. These existing highways and Highway 113, when built, will continue to play an important role in regulating access.

Given these highway barriers, a key aspect of park development must be defining and creating meaningful access points from all of the surrounding communities. Access locations should allow for daily use of the park by existing community residents, and should occur in locations and at a frequency that will encourage park use without necessarily getting into a motorized vehicle.

For the purpose of understanding and helping envision the opportunities for community access, the following possibilities are shown in **Figure 5.1**:

- *Susies Lake* – This access point could be on an extension of Timberlea Village Parkway to Susies Lake. This could be a primary entry to the park extending from Exit 3 on Highway 102, and might also be a suitable location for developing community recreation facilities to serve the Beechville/Lakeside/ Timberlea area.

- *Quarry Lake* – An underpass beneath Highway 102 could extend from Glenbourne Estates to a point near the eastern edge of Quarry Lake. This could provide safe access to park lands for the many residents in the western portions of Clayton Park as well as Glenbourne Estates, and Rockingham Ridge.

- *Hemlock Ravine/Kearney Lake* – The new park could be linked with the well-established Hemlock Ravine Park via the existing road network between the entrance to Hemlock Ravine at Julies Walk and Saskatoon Drive at Kearney Lake. An alternative or additional connection might occur at the new interchange on the Bicentennial

Highway for The Ravines development, with a trail link to the park.

- *Paper Mill Lake* – Farther north another underpass beneath Highway 102 could allow residents of western Bedford and, particularly, Paper Mill Lake to gain access to the area at the head of Kearney Lake. From there, a trail connection could lead to the park.

- *Bedford West* – A passage parallel to Black Duck Brook and/or along the proposed new streets of Bedford West could allow residents of the proposed community of Bedford West, as well as some Kingswood residents, to access the park.

- *Kingswood* – A possible interchange with Highway 113 would provide access to the park for residents of Kingswood and for Highway 113 drivers. Access in this area would provide the most direct means for residents and visitors to ascend Blue Mountain Hill to view the countryside.

- *Maple Lake* – An access under Highway 113 at Maple Lake, and an extension of trials in the natural corridor area could connect residents of Tantallon to the Park.

- *Stillwater Lake* – An access point in the vicinity of the Mill Pond, which is fed by Stillwater Lake and its tributaries, could provide access to the park from Timberlea and the Pierceys Investments development via a proposed trail spur from the BLT Trail.

- *Lakeside*– A second spur from the BLT Trail could provide access from the central portion of Beechville and Lakeside and future residential development in the Governors Lake area.

To further fulfill the Park's role in providing daily experience, these access trails could be developed as multi-use trails, particularly in association with major access locations. Such multi-purpose trail linkages will facilitate access by walkers, joggers, and bicyclists. As much as possible, these access trails should be linked to the sidewalks and internal trail systems of the surrounding communities.

The access system should also respond to CPTED guidelines. Identifiable, controlled access points promote surveillance. A balanced approach to lighting is required to ensure safety without unnecessary disturbance of the natural environment. Lighting is, however, very important in locations to which users are invited. To this end, directed lighting should be specified for all access points. The design of confined passages should likewise take into considerations of user safety by ensuring openness and visibility, as well as appropriate lighting.

5.4.7 Active Transportation

HRM is currently pursuing a major "active transportation" initiative to encourage self-propelled modes of transportation (e.g., in-line skating, walking, jogging, cycling, and skateboarding) in place of motorized vehicles within the region. A draft of the Active Transportation Plan is to be presented to the public through Open Houses announced for the Spring of 2006.[21] Both the establishment of a park within the Study Area and the securing of the Highway 113 right of way are potentially very supportive of active transportation objectives.

Possible active transportation routes identified through the plan emphasize north-south connections from Sackville through Bedford, flanking the sides of Halifax Harbour. Opportunities for effective east-west connections are limited.

The proposed Highway 113 right-of-way is wider than normal, providing a full 150 metres of width. While current TPW policy allows for up to 300 metres of trail within a highway right-of-way, the extra right-of-way width along Highway 113 may provide an opportunity to consider an active transportation corridor within the outer 25 metres of the proposed right-of-way. This could create the opportunity to provide active transportation access from Tantallon, Timberlea, and subdivisions south of the Hammonds Plains Road to Bedford.

Active transportation routes should also be considered when developing internal circulation systems in the park. For example, as shown in **Figure 5.1**, a circumferential route around the park could provide an active transportation link between Hammonds Plains/Kingswood and the Bayers Lake Business Park. A similar link is also possible from both Timberlea and the Kearney Lake area to Bayers Lake Business Park.

5.5 CONCLUSIONS:

The following are specific conclusions of **Chapter 5**.

5.5.1 Principles for Demarcating the Park Boundary

It is recommended that the final Park Boundary be demarcated in the future. When selecting the final park boundary, the following principles should be considered.

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[21] See: www.halifax.ca/activetransportation/index.html. The HRM site provides access to a variety of materials generated by the Active Transportation Plan project including newsletters, updates, and preliminary planning documents.

These principles were outlined in detail in previous Sections of this Chapter, and are as follows:

- There are a number of equally good options for the final park boundary. That said, to be consistent with the values of this study, the final boundary should include: 1) a large intact patch that is isolated from development; 2) provided there is a large patch, areas incorporating more of the valued park attributes (**Figure 19, Appendix A**) should be preferred over those that do not, and 3) Susies Lake and Blue Mountain should both be within the park boundary.

- One role of a Municipal wilderness park is to provide residents with a regular fulfilling natural experience. Regular, daily contact suggests that the park area selected should be highly accessible from new and existing communities, with many access locations, and opportunities to arrive using a variety of transportation modes, including walking, hiking, bicycling, in-line skating, public transportation, automobiles, canoes, etc.

- A second role of a Municipal wilderness park is providing a relatively safe and secure wilderness experience. This role suggests that areas selected for the most intense recreational activity should be immediately adjacent to areas that have existing or planned future community development. This will allow the park design to incorporate CPTED (Crime Prevention Through Environmental Design) principles in the areas most heavily used by people.

- An important opportunity for a Municipal wilderness park is that it can provide natural experiences for those who often are unable to access them, including the young, the elderly, the infirm, and the poor.

- The proposed park area should be connected to at least one and preferably two adjacent resource lands. This connectivity is necessary to maintain species richness and diversity within the park boundary over the long term.

- The area proposed for the park should include the following elements: 1) a Core wilderness area that is silent and isolated; 2) a surrounding area of Edge wilderness that is the focus of wilderness recreational activities; 3) a meaningful landscape corridor connecting the designated park area to the extensive Crown holdings beyond; 4) an area of community development around and interspersed with the Edge landscape of the park that is designed in a manner to implement CPTED principles; 5) at least one and preferably two significant regional access locations; and, 6) linkages to all of the surrounding communities including active transportation initiatives.

- The Core area should be large enough to include a full day walk on foot in an atmosphere that feels isolated. It should be made visible, for example, its expanse might lie before the viewer from the top of a hill, but it should not necessarily be easily penetrable. The Core area should incorporate a wide variety of landscape types and areas that offer the potential for high species richness. Access to the Core wilderness area should be entirely through the surrounding Edge wilderness area, allowing the Edge to provide a buffer zone to the Core landscape, keeping it quiet and protected.

- The Edge wilderness landscape should be a band of wilderness ranging in depth from approximately 100 to 1000 metres around the Core landscape. The Edge should offer extensive opportunities to experience the wilderness on a daily basis. Because of the adjacent Core, one side of the Edge landscape should always be quiet. Simultaneously, the Edge landscape should be sufficiently narrow and interspersed with community development such that CPTED principles may be applied. The Edge landscape should encompass the cherished locations of the study area as well as landscapes that host the wilderness species best loved by people. It should include a continuous multi-purpose trail system that also provides for half hour and one hour trails that loop back to the starting spot. It should include a large number of "Interesting Area Attributes" such as interesting forest stands, dams, unique ground flora, and geological resources.

- The relationship between community development and a wilderness park is complex and inter-related. To provide a wilderness experience, development should not feel like it is impinging on the park, and yet it must be accessible. The recommended shape of the future boundary of the park is a curvilinear, with interspersed areas of community development. The final boundary should be determined while simultaneously considering the ideal community build-out such that both the park and community perform well.

- The proximity of the park to the Provincial highway system can facilitate access where it is provided for. At least one and preferable two regional park entrances should be developed to provide convenient access from the Highway system. The extra right-of-way width provided along the proposed Highway 113 may provide an opportunity to consider an active transportation corridor within the outer 25 metres of the proposed right-of-way. This active transportation corridor could provide important alternative transportation access to the park.

- Given the highway barriers, a key aspect of park development must be defining and creating meaningful access points from all of the surrounding communities. Access locations should allow for daily use of the park by existing community residents, and should occur in locations and at a frequency that will encourage park use without necessarily getting into a motorized vehicle. The access system should also respond to CPTED guidelines.

5.5.2 The Implications of Highway 113

Section 5.4 considered what an ideal park boundary might look like. Through this concept exploration, some conclusions were reached about the nature of the relationship between the proposed "ideal" Park and the proposed Highway 113. These conclusions are summarized below:

- Only a small portion of the ideal park boundary touches the Highway 113 corridor, just north of Blue Mountain Hill. The section is approximately 1,400 metres long and constitutes only approximately 7.4 per cent of the total perimeter of the park. In this location, the highway grade is below the elevation of the park, and thus the visual impact will be less than the alternative arrangement.

- The proposed Highway 113 where it abuts the ideal park boundary is immediately adjacent to residential development in the Kingswood area that has experienced rapid expansion. The location of the alignment abutting this development will serve to curtail further expansion and aid in protecting some of the lands considered most appropriate for the park.

- One of the primary benefits of the Highway is that it has the potential to provide a regional access location to the park as part of a future interchange to Kingswood. An entrance to the park at Blue Mountain could provide access to a feature that is as notable in the landscape as Mont Royal in Montreal, Quebec and Cadillac Mountain in Bar Harbour, Maine.

- The detailed design of the Highway right-of-way should consider mimicking natural landscape forms and other aesthetic criteria. If appropriately detailed, the future highway could provide a "parkway-like" experience for the motorist raising the visual profile of the Park. The wider highway right-of-way proposed for Highway 113 should allow for the incorporation of more natural and visually appealing grade transitions between the roadbed and the surrounding landscape.

- The proposed Highway 113 right-of-way offers the potential opportunity for an active transportation corridor between Timberlea/Tantallon and Hammonds Plains/Bedford. If accommodated, the ability of the proposed park to link to this east/west active transportation corridor will greatly improve the accessibility of the park to residents and visitors.

- The greatest concern of the proposed Highway 113 adjacency to the ideal park area is the potential interruption of access for people moving north/south whether in vehicles, on foot or bicycle, or portaging a canoe on the waterways. A critical component of future highway design relative to the proposed park, must be direct and safe access from each of the neighbourhoods on the other side of the proposed Highway 113, including: Kingswood, Bedford West, and Tantallon. In addition, existing trails and portage routes through the Crown resource lands should be accommodated following appropriate CPTED principles.

- Each access for people that crosses the highway to the proposed park, should also be accessible from trailheads on local and collector roads associated with development on "the other side of the highway". In this way, communities adjacent to the future Highway 113 can provide access to the park, without encouraging parking at impromptu laybys on the proposed Highway 113.

- The highway has the potential to interrupt the regular flow of species that may be necessary to repopulate a heavily used wilderness parkland. Highway design that facilities the movement of a wide variety of plant and animal species should be considered particularly through the resource lands owned by the Crown.

- Through careful detailed highway design, as described above, the proposed Highway 113 corridor offers many opportunities for 1) the protection of the ideal park land area in the short term by limiting development expansion, and 2), providing significant regional and local access to the park when it is formalized and established in the future.

5.5.3 Next Steps: a Strategy for Moving Forward

The total land area included in the ideal park configuration described in **Section 5.4** is approximately 1700 ha (including lakes) and 1450 ha (excluding lakes). Of the proposed park area, approximately 900 ha is on lands owned by the Crown and a further 550 acres is held privately. A portion of municipal property (PID 40701955) is required for park access just south of Susies Lake. The private holdings include:

- Land around Susies and Quarry Lakes currently owned by Annapolis Group Inc.
- Land encircling Fox Lake owned by Kimberley-Lloyd Developments Ltd.
- Land bordering the southwest shore of Susies Lake as well as the southern shores of Big Cranberry Lake and Little Cranberry Lake owned by Parkdale Developments Ltd.
- Land to the south of Susies Lake owned by the Sisters of Charity

DNR staff state that DNR's involvment in this study was based on its role as custodian of the Crown lands included in the Regional Park as proposed by HRM;

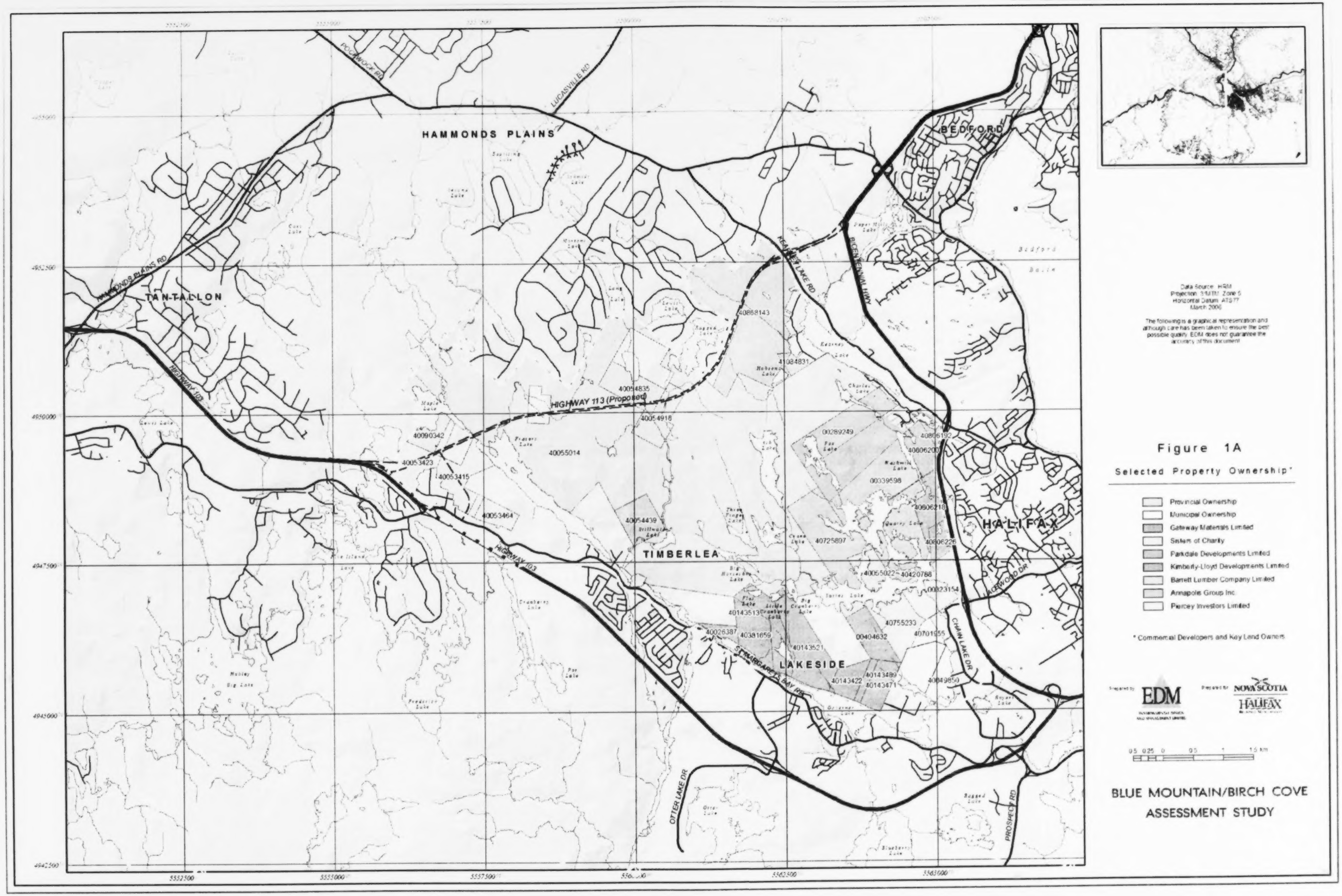
the Department neither agrees nor disagrees with the Crown lands being encompassed in the proposed park. Implementing HRM's Blue Mountain/Birch Cove Lakes park vision will require many years and a great deal of cooperation between DNR and HRM. It is recommended that HRM and DNR work together to develop a mechanism for cooperation as well as a detailed long-term strategy for implementing this initiative. There are a variety of mechanisms for HRM to work with DNR including HRM's input to Crown land management through DNR's IRM process for Crown lands, which includes the upcoming development of the IRM Long Range Management Framework for the area. In addition, HRM might consider a specific Project Proposal to DNR that would request the creation of a joint implementation plan, including a management agreement for the Crown lands in the manner similar to that achieved between HRM and DNR at Hemlock Ravine.

It is important to note that much of the area proposed for the "Core" wilderness is currently on land owned by the Crown. The Crown lands in this area include some areas where DNR may be managing to re-establish more original forest assemblages, which offers wonderful long-term interpretive potential.

Decisions about the need to acquire land should be made jointly by both agencies. In addition to land acquisition, HRM has a variety of regulatory options available to obtain additional private lands, including the masterplan mechanism which to date have typically provided approximately 30% public land reservation. Other opportunities include public/private partnerships, and partnerships with non-governmental agencies to provide wilderness easements.

The unique partnership of TPW, DNR and HRM that led to the creation of this study is a fine example of inter-governmental cooperation. The Steering Committee acknowledges the Report as an initial stage in what will likely be a long-term relationship to ensure an integrated approach to future highway development, natural resource management and park planning and development. Further discussions will be necessary to define the mechanisms and working agreements that will meet the needs of all three agencies.

APPENDIX A: STUDY AREA MAPPING


HAMMONDS PLAINS
BEDFORD
TANTALLON
TIMBERLEA
LAKESIDE
HALIFAX
HAMMONDS PLAINS RD
POCKWOCK RD
LUCASVILLE RD
KEARNEY LAKE RD
BICENTENNIAL HWY
HIGHWAY 103
HIGHWAY 113 (Proposed)
ST MARGARETS BAY RD
OTTER LAKE DR
CHAIN LAKE DR
PROSPECT RD
Bedford Basin
40868143
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4942500
Provincial Ownership
Municipal Ownership
Gateway Materials Limited
Sisters of Charity
Parkdale Developments Limited
Kimberly-Lloyd Developments Limited
Barrett Lumber Company Limited
Annapolis Group Inc
Piercey Investors Limited
0.5 0.25 0 0.5 1 1.5 km

Data Source: HRM
Projection: 3°MTM Zone 5
Horizontal Datum: ATS77
March 2006

The following is a graphical representation and although care has been taken to ensure the best possible quality EDM does not guarantee the accuracy of this document

Figure 1A

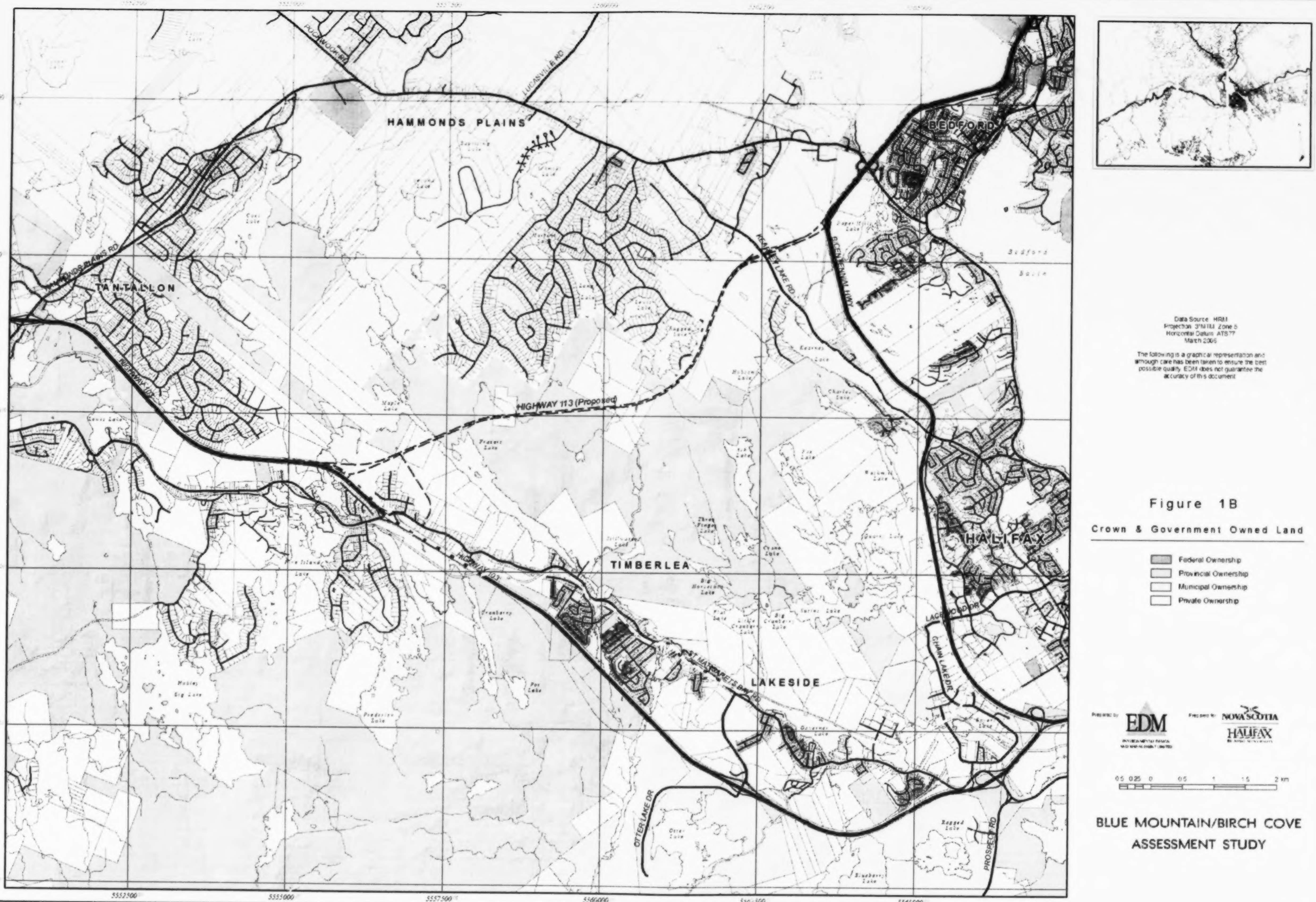
Selected Property Ownership*

* Commercial Developers and Key Land Owners

Prepared by EDM

Prepared for NOVA SCOTIA HALIFAX

BLUE MOUNTAIN/BIRCH COVE
ASSESSMENT STUDY


HAMMONDS PLAINS
BEDFORD
TANTALLON
TIMBERLEA
LAKESIDE
HALIFAX
HAMMONDS PLAINS RD
POCKWOCK RD
LUCASVILLE RD
HIGHWAY 103
HIGHWAY 113 (Proposed)
KEARNEY LAKE RD
BICENTENNIAL HWY
ST MARGARETS BAY RD
LACEWOOD DR
CHAIN LAKE DR
OTTER LAKE DR
PROSPECT RD
Bedford Basin
4955000
4952500
4950000
4947500
4945000
4942500
5552500
5555000
5557500
5560000
5562500
5565000

Data Source: HRM
Projection: 3°MTM Zone 5
Horizontal Datum: ATS77
March 2006

The following is a graphical representation and although care has been taken to ensure the best possible quality, EDM does not guarantee the accuracy of this document

Figure 1B

Crown & Government Owned Land

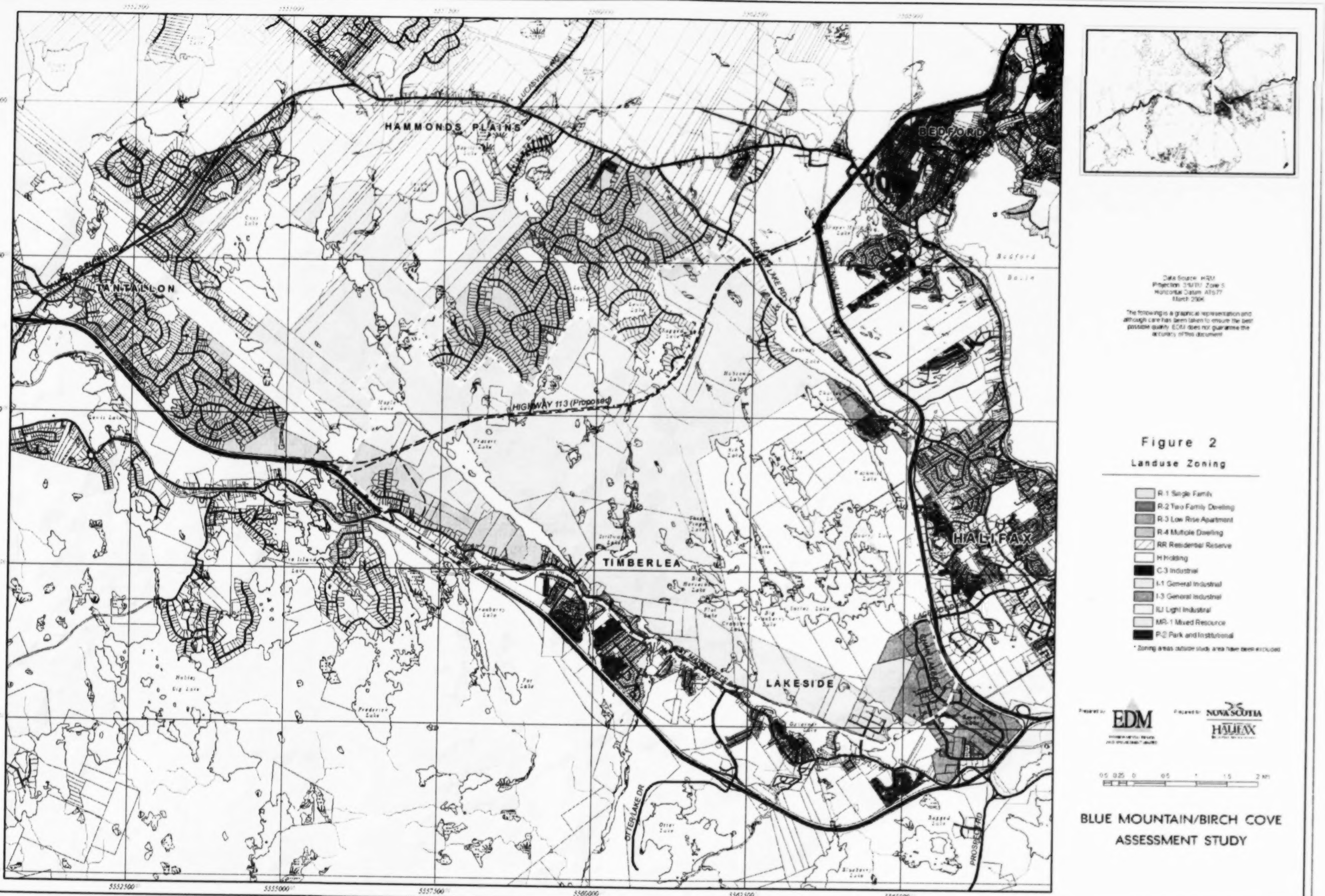
- ▨ Federal Ownership
- ☐ Provincial Ownership
- ☐ Municipal Ownership
- ☐ Private Ownership

Prepared by EDM

Prepared for NOVA SCOTIA HALIFAX

0.5 0.25 0 0.5 1 1.5 2 km

BLUE MOUNTAIN/BIRCH COVE ASSESSMENT STUDY


HAMMONDS PLAINS
BEDFORD
TANTALLON
HIGHWAY 113 (Proposed)
TIMBERLEA
HALIFAX
LAKESIDE
Bedford
Basin
LUCASVILLE RD
OTTER LAKE DR
PROSPECT RD
4955000
4952500
4950000
4947500
4945000
4942500
5552500
5555000
5557500
5560000
5562500
5565000
0.5 0.25 0 0.5 1 1.5 2 km

Data Source: HRM
Projection: 3TM NAD Zone 5
Horizontal Datum: ATS77
March 2006

The following is a graphical representation and although care has been taken to ensure the best possible quality, EDM does not guarantee the accuracy of this document.

Figure 2

Landuse Zoning

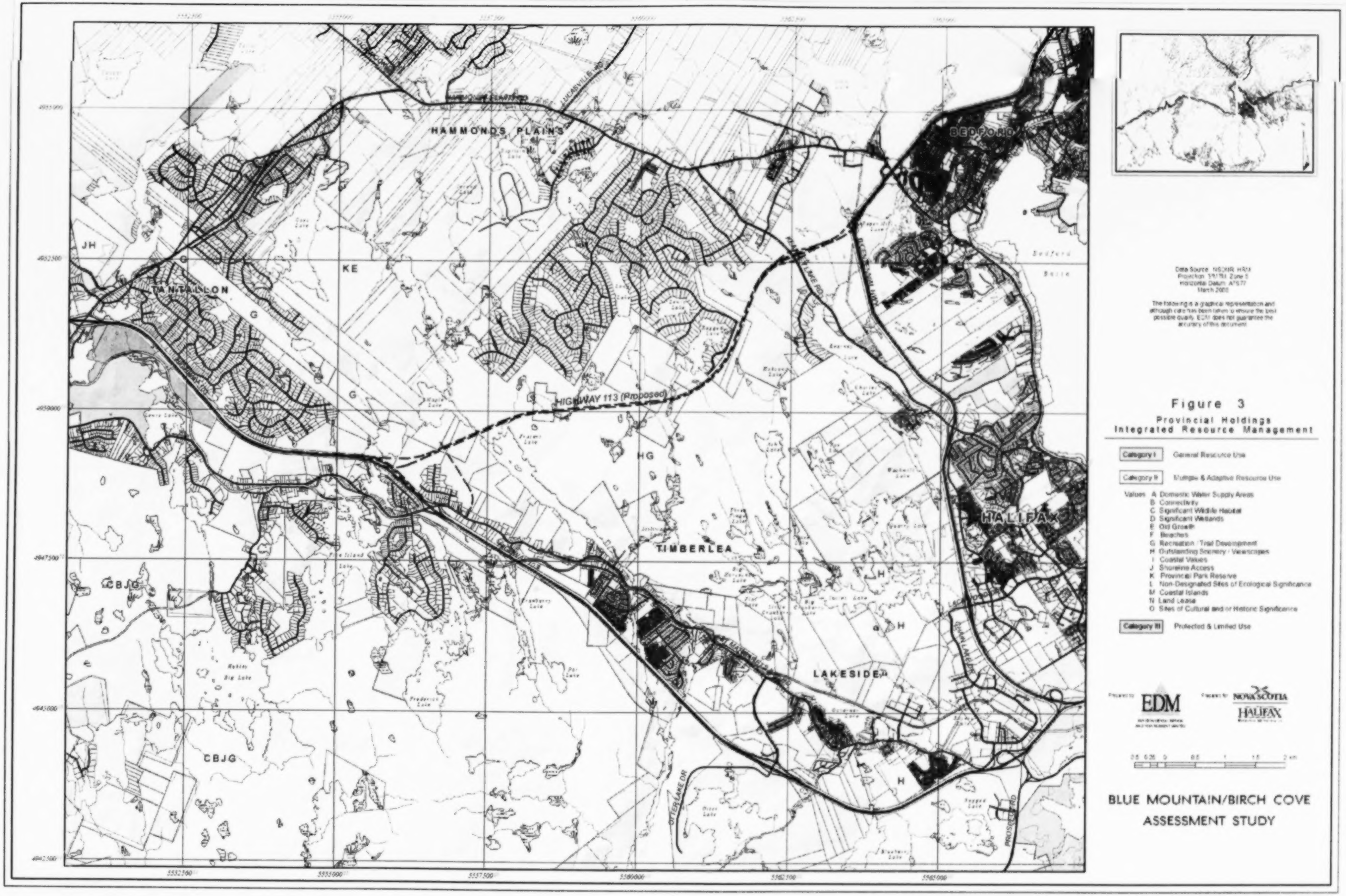
▢	R-1 Single Family
■	R-2 Two Family Dwelling
▩	R-3 Low Rise Apartment
▩	R-4 Multiple Dwelling
▨	RR Residential Reserve
▢	H Holding
■	C-3 Industrial
▢	I-1 General Industrial
▩	I-3 General Industrial
▢	IU Light Industrial
▢	MR-1 Mixed Resource
■	P-2 Park and Institutional

* Zoning areas outside study area have been excluded

Prepared by EDM

Prepared for NOVA SCOTIA HALIFAX

BLUE MOUNTAIN/BIRCH COVE
ASSESSMENT STUDY


HAMMONDS PLAINS
BEDFORD
TANTALLON
TIMBERLEA
LAKESIDE
HALIFAX
HIGHWAY 113 (Proposed)
JH
KE
G
HG
H
CBJG
Bedford
Basin
Category I General Resource Use
Category II Multiple & Adaptive Resource Use
Values A Domestic Water Supply Areas
B Connectivity
C Significant Wildlife Habitat
D Significant Wetlands
E Old Growth
F Beaches
G Recreation / Trail Development
H Outstanding Scenery / Viewscapes
I Coastal Values
J Shoreline Access
K Provincial Park Reserve
L Non-Designated Sites of Ecological Significance
M Coastal Islands
N Land Lease
O Sites of Cultural and or Historic Significance
Category III Protected & Limited Use
0.5 0.25 0 0.5 1 1.5 2 km
4955000
4952500
4950000
4947500
4945000
4942500
5552500
5555000
5557500
5560000
5562500
5565000

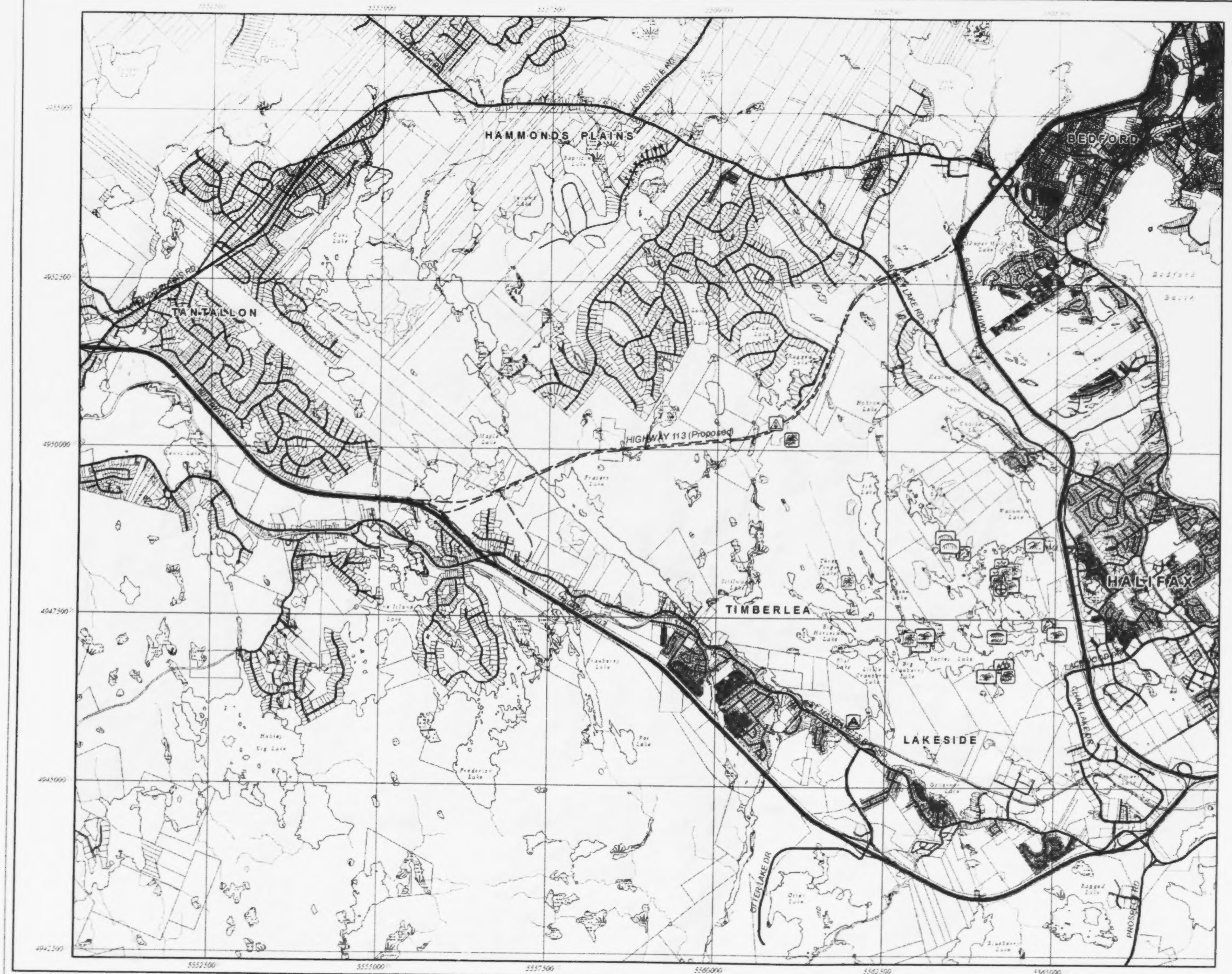
Data Source: NSDNR, HRM
Projection: 3°UTM Zone 5
Horizontal Datum: ATS77
March 2000

The following is a graphical representation and although care has been taken to ensure the best possible quality, EDM does not guarantee the accuracy of this document.

Figure 3
Provincial Holdings
Integrated Resource Management

Prepared by EDM
Prepared for NOVA SCOTIA HALIFAX

BLUE MOUNTAIN/BIRCH COVE
ASSESSMENT STUDY


HAMMONDS PLAINS
TANTALLON
BEDFORD
HALIFAX
TIMBERLEA
LAKESIDE
HIGHWAY 113 (Proposed)
LUCASVILLE RD
KEARNEY LAKE RD
OTTER LAKE DR
PROSPECT RD
Bedford Basin
4955000
4952500
4950000
4947500
4945000
4942500
5552500
5555000
5557500
5560000
5562500
5565000

Data Source: NSDNR (Mineral Information)
Blue Mountain Birch Cove Lakes Society, HRM (Base Data)

Projection: 3°MTM, Zone 5
Horizontal Datum: ATS77
March 2006

The following is a graphical representation and although care has been taken to ensure the best possible quality, EDM does not guarantee the accuracy of this document.

Figure 4

Interesting Area Attributes

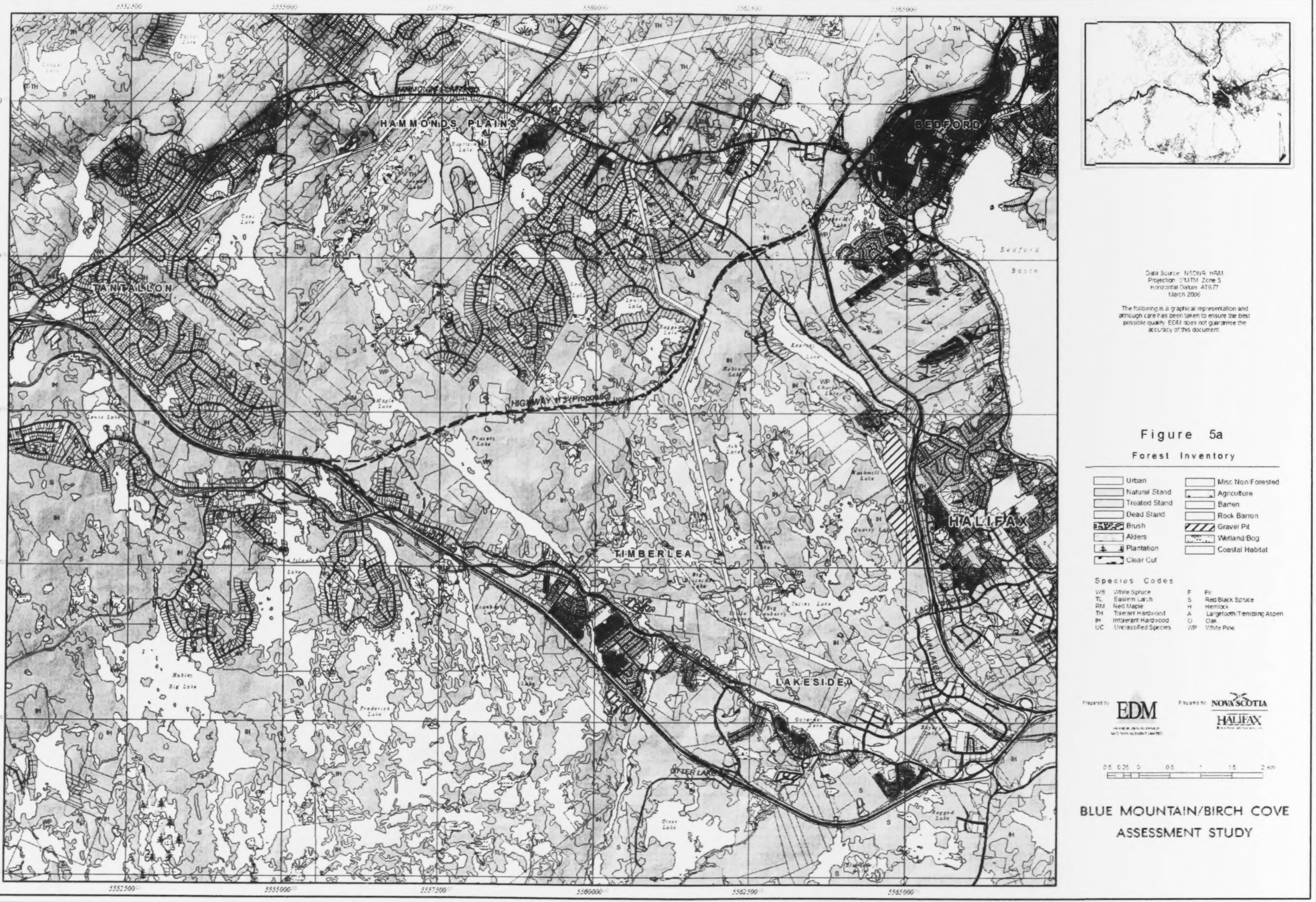
▨	Interesting Forest Stands
	Beaver dam
	Beaver lodge
	Cliff
	Jack pine stand
	Rapids
	Lakeshore beach area
	Oak barren
	Undiseased beech
	Greenland sandwort (>10 clusters)
	Greenland sandwort (5-10 clusters)
⊕	Quarry Lake Quarry (dimension stone)
▲	Mineral Resource (location approximate)

Prepared by EDM

Prepared for NOVA SCOTIA / HALIFAX

0.5 0.25 0 0.5 1 1.5 2 km

BLUE MOUNTAIN/BIRCH COVE
ASSESSMENT STUDY


HAMMONDS PLAINS
BEDFORD
TANTALLON
HIGHWAY 113 (Proposed)
HALIFAX
TIMBERLEA
LAKESIDE
Bedford Basin
5552500
5555000
5557500
5560000
5562500
5565000
4955000
4952500
4950000
4947500
4945000
4942500
0.5 0.25 0 0.5 1 1.5 2 km
Prepared by EDM
Prepared for NOVA SCOTIA HALIFAX

Data Source: NSDNR, HRM
Projection: 3°MTM Zone 5
Horizontal Datum: ATS77
March 2006

The following is a graphical representation and although care has been taken to ensure the best possible quality, EDM does not guarantee the accuracy of this document.

Figure 5a

Forest Inventory

Urban	Misc Non/Forested
Natural Stand	Agriculture
Treated Stand	Barren
Dead Stand	Rock Barren
Brush	▨ Gravel Pit
Alders	Wetland/Bog
Plantation	Coastal Habitat
Clear Cut	

Species Codes

WS	White Spruce	F	Fir
TL	Eastern Larch	S	Red/Black Spruce
RM	Red Maple	H	Hemlock
TH	Tolerant Hardwood	A	Largetooth/Trembling Aspen
IH	Intolerant Hardwood	O	Oak
UC	Unclassified Species	WP	White Pine

BLUE MOUNTAIN/BIRCH COVE
ASSESSMENT STUDY

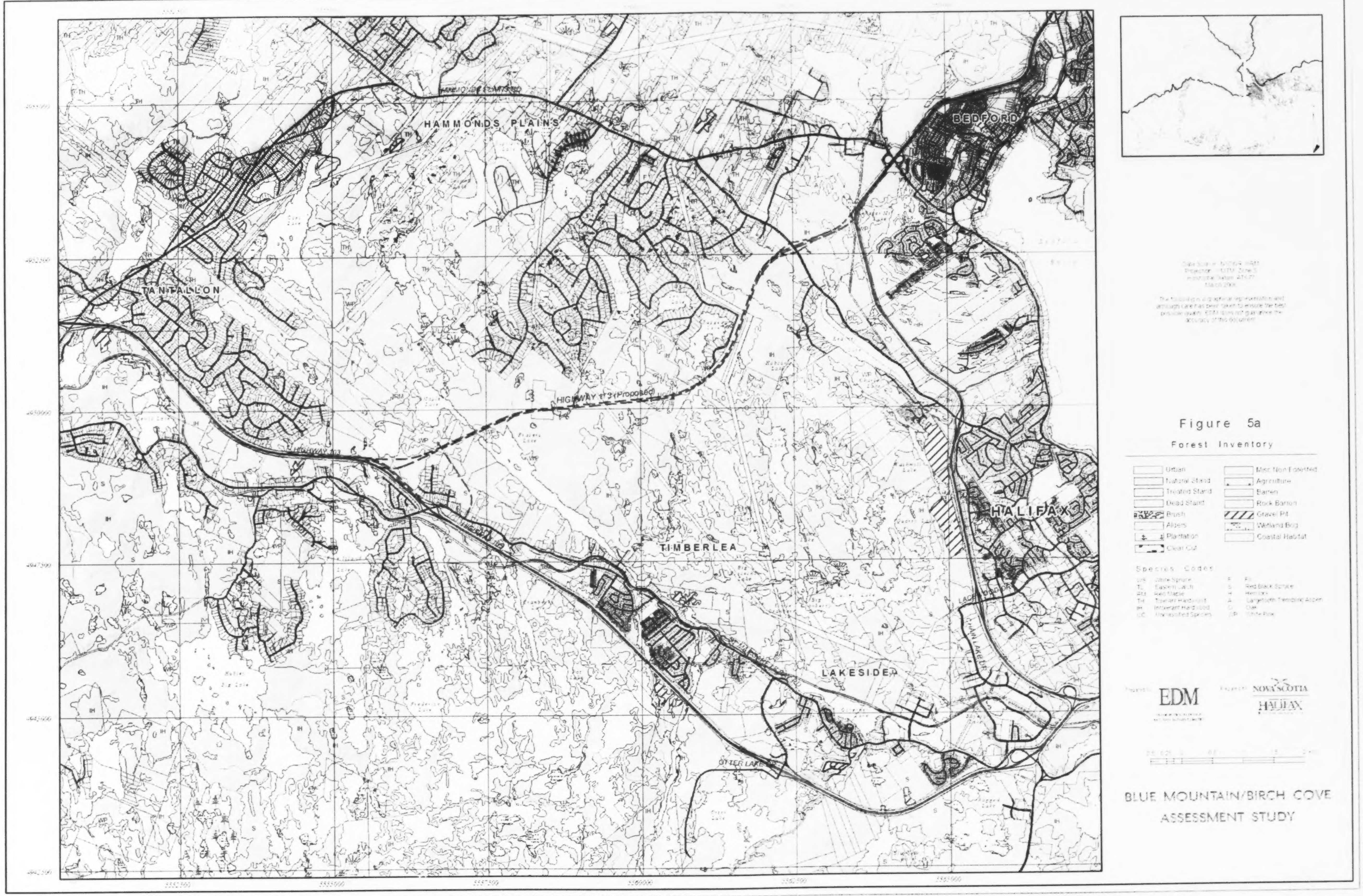
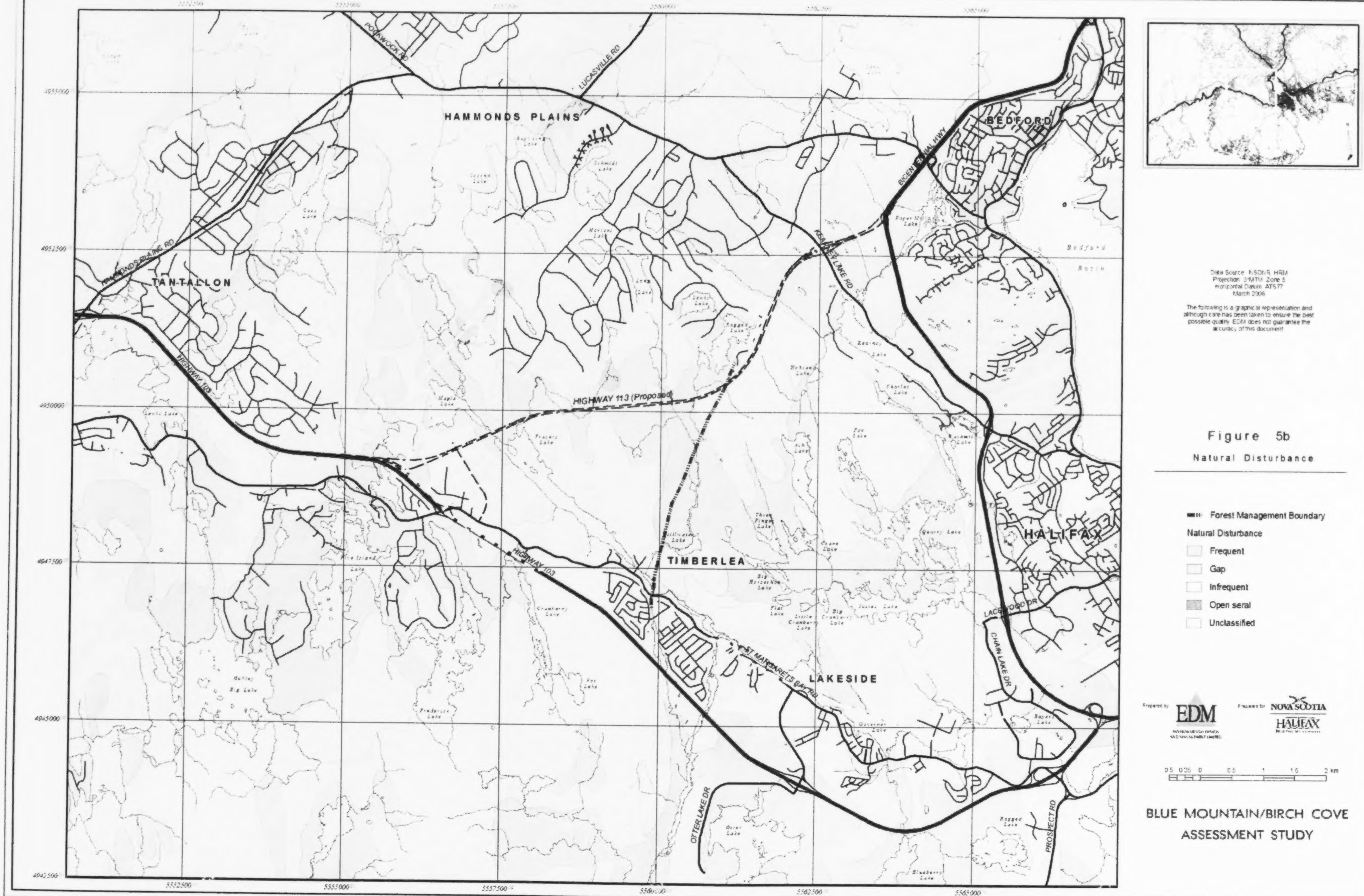

HAMMONDS PLAINS
BEDFORD
TANTALLON
HIGHWAY 113 (Proposed)
HIGHWAY 103
HALIFAX
TIMBERLEA
LAKESIDE
OTTER LAKE
Data Source: NSDNR, HRM
Projection: UTM Zone 5
Horizontal Datum: ATS77
March 200[illegible]
The following is a graphical representation and although care has been taken to ensure the best possible quality, EDM does not guarantee the accuracy of this document.
Urban
Natural Stand
Treated Stand
Dead Stand
Brush
Alders
Plantation
Clear Cut
Misc Non Forested
Agriculture
Barren
Rock Barren
Gravel Pit
Wetland Bog
Coastal Habitat
Species Codes
WS White Spruce
TL Eastern Larch
RM Red Maple
TH Tolerant Hardwood
IH Intolerant Hardwood
UC Unclassified Species
F Fir
S Red Black Spruce
H Hemlock
A Largetooth Trembling Aspen
O Oak
WP White Pine
EDM
NOVA SCOTIA
HALIFAX

Figure 5a

Forest Inventory

BLUE MOUNTAIN/BIRCH COVE
ASSESSMENT STUDY


5552500
5555000
5557500
5560000
5562500
5565000
4955000
4952500
4950000
4947500
4945000
4942500
POCKWOCK RD
LUCASVILLE RD
HAMMONDS PLAINS
HAMMONDS PLAINS RD
TAN-TALLON
HIGHWAY 103
HIGHWAY 113 (Proposed)
KEARNEY LAKE RD
BICENTENNIAL HWY
BEDFORD
Bedford Basin
HALIFAX
TIMBERLEA
LAKESIDE
ST MARGARETS BAY RD
LACEWOOD DR
CHAIN LAKE DR
OTTER LAKE DR
PROSPECT RD
Maple Lake
Frasers Lake
Kearney Lake
Charles Lake
Fox Lake
Quarry Lake
Three Finger Lake
Crane Lake
Big Horseshoe Lake
Flat Lake
Little Cranberry Lake
Big Cranberry Lake
Susies Lake
Governor Lake
Cranberry Lake
Frederick Lake
Pine Island Lake
Stillwater Lake
Lewis Lake
Long Lake
Ragged Lake
Blueberry Lake
Forest Management Boundary
Natural Disturbance
Frequent
Gap
Infrequent
Open seral
Unclassified
Prepared by
EDM
ENVIRONMENTAL DESIGN AND MANAGEMENT LIMITED
Prepared for
NOVA SCOTIA
HALIFAX
0.5 0.25 0 0.5 1 1.5 2 km

Data Source: NSDNR, HRM
Projection: 3°MTM Zone 5
Horizontal Datum: ATS77
March 2006

The following is a graphical representation and although care has been taken to ensure the best possible quality, EDM does not guarantee the accuracy of this document.

Figure 5b
Natural Disturbance

BLUE MOUNTAIN/BIRCH COVE
ASSESSMENT STUDY

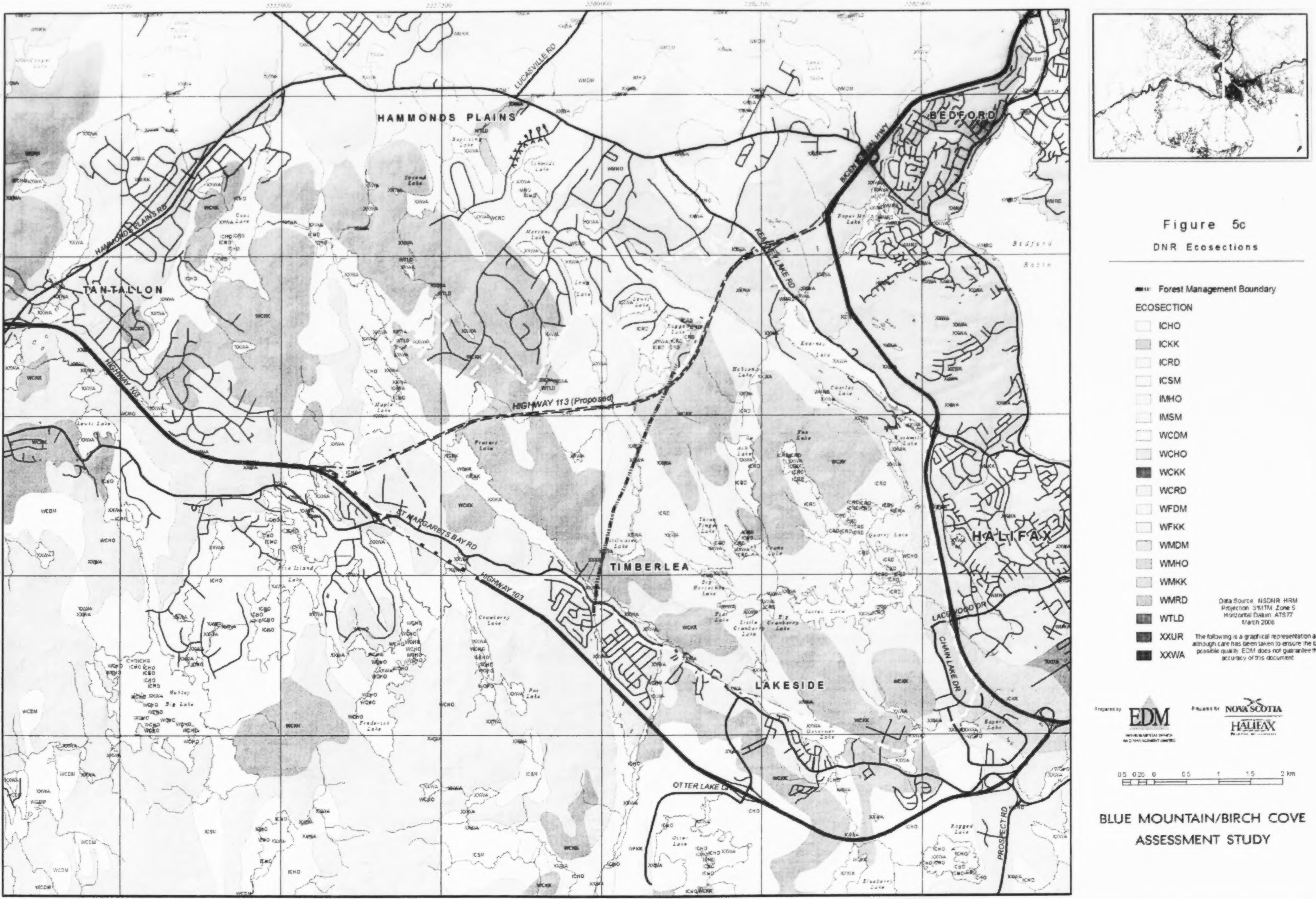

HAMMONDS PLAINS
BEDFORD
TANTALLON
TIMBERLEA
LAKESIDE
HALIFAX
LUCASVILLE RD
HAMMONDS PLAINS RD
HIGHWAY 103
HIGHWAY 113 (Proposed)
ST MARGARETS BAY RD
KEARNEY LAKE RD
BEDFORD HWY
LACEWOOD DR
CHAIN LAKE DR
OTTER LAKE DR
PROSPECT RD
Bedford Basin
4955000
4952500
4950000
4947500
4945000
4942500
5552500
5555000
5557500
5560000
5562500
5565000
05 025 0 05 1 15 2 km

Figure 5c

DNR Ecosections

▬ Forest Management Boundary

ECOSECTION

- ☐ ICHO
- ▨ ICKK
- ☐ ICRD
- ☐ ICSM
- ☐ IMHO
- ☐ IMSM
- ☐ WCDM
- ▨ WCHO
- ■ WCKK
- ☐ WCRD
- ☐ WFDM
- ☐ WFKK
- ▨ WMDM
- ▨ WMHO
- ▨ WMKK
- ▨ WMRD
- ■ WTLD
- ■ XXUR
- ■ XXWA

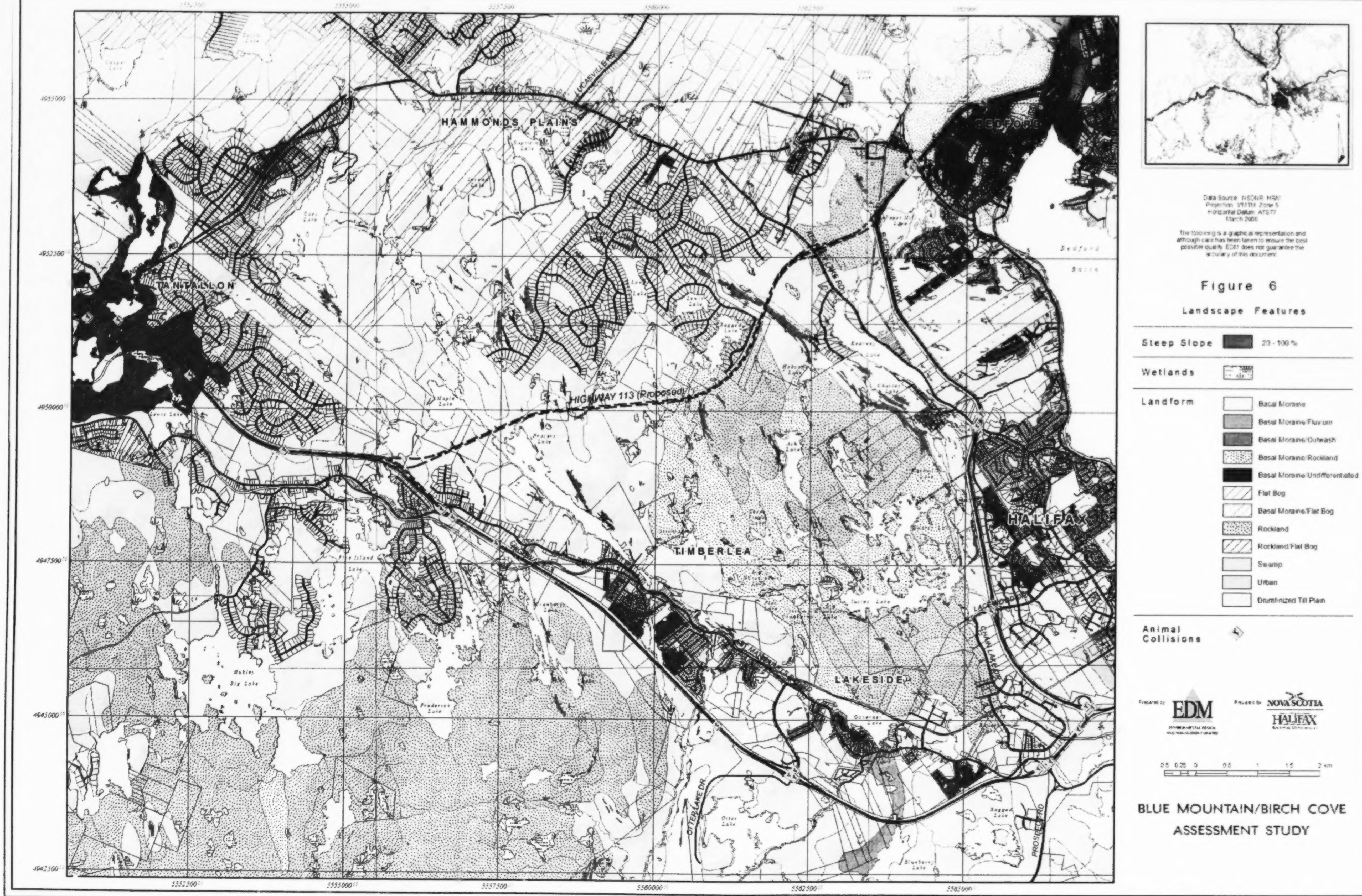
Data Source NSDNR HRM
Projection 3°MTM Zone 5
Horizontal Datum ATS77
March 2006

The following is a graphical representation and although care has been taken to ensure the best possible quality EDM does not guarantee the accuracy of this document

Prepared by EDM

Prepared for NOVA SCOTIA HALIFAX

BLUE MOUNTAIN/BIRCH COVE
ASSESSMENT STUDY


HAMMONDS PLAINS
TANTALLON
BEDFORD
Bedford Basin
HIGHWAY 113 (Proposed)
TIMBERLEA
HALIFAX
LAKESIDE
LUCASVILLE RD
OTTER LAKE DR.
PROSPECT RD
Hubley Big Lake
Frederick Lake
Pine Island Lake
Maple Lake
Otter Lake
Blueberry Lake
Ragged Lake
4955000
4952500
4950000
4947500
4945000
4942500
5552500
5555000
5557500
5560000
5562500
5565000
Steep Slope
20 - 100 %
Wetlands
Landform
Basal Moraine
Basal Moraine/Fluvium
Basal Moraine/Outwash
Basal Moraine/Rockland
Basal Moraine/Undifferentiated
Flat Bog
Basal Moraine/Flat Bog
Rockland
Rockland/Flat Bog
Swamp
Urban
Drumlinized Till Plain
Animal Collisions
0.5 0.25 0 0.5 1 1.5 2 km

Data Source: NSDNR, HRM
Projection: 3°MTM Zone 5
Horizontal Datum: ATS77
March 2006

The following is a graphical representation and although care has been taken to ensure the best possible quality, EDM does not guarantee the accuracy of this document.

Figure 6

Landscape Features

Prepared by EDM Environmental Design and Management Limited

Prepared for Nova Scotia Halifax Regional Municipality

BLUE MOUNTAIN/BIRCH COVE
ASSESSMENT STUDY

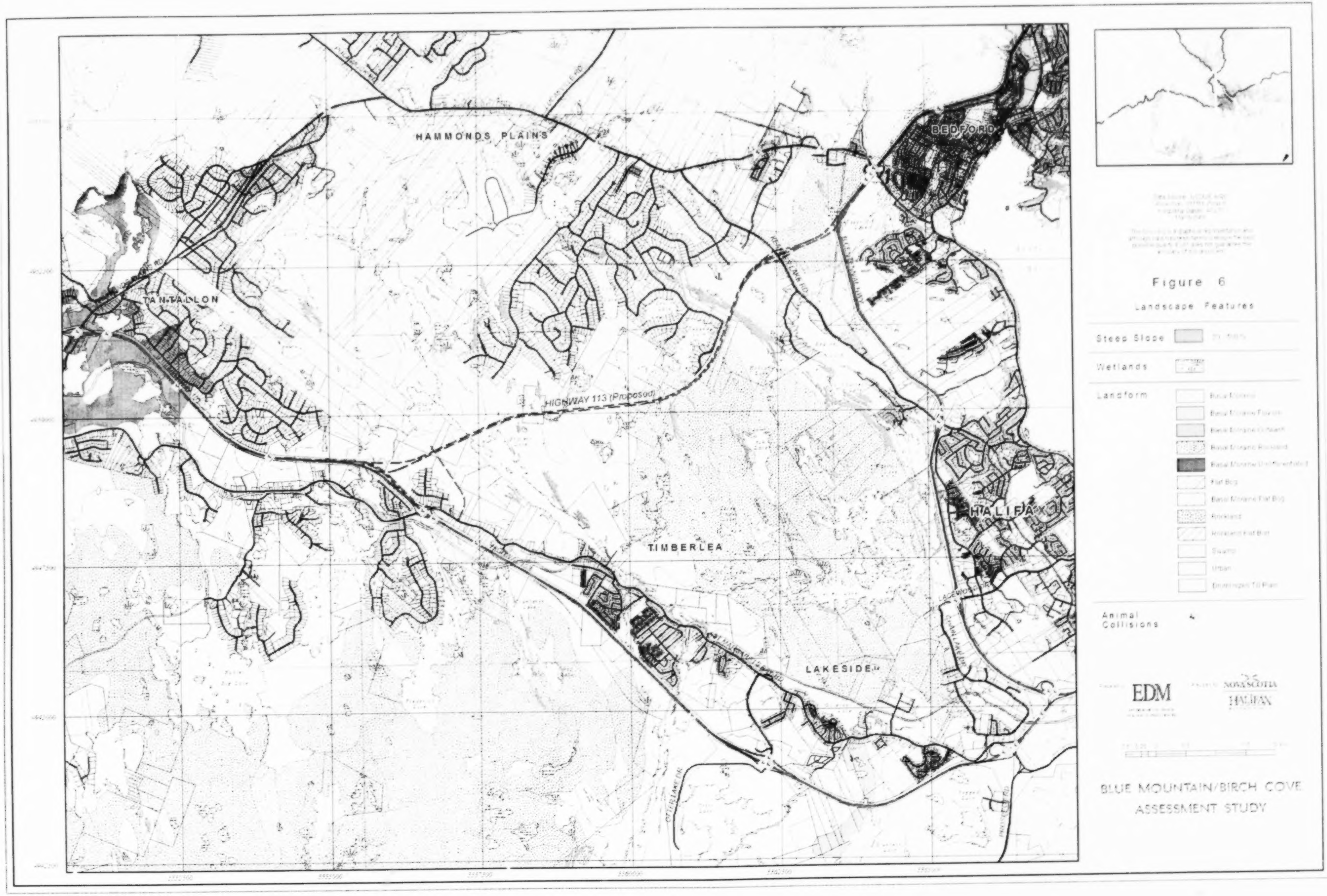
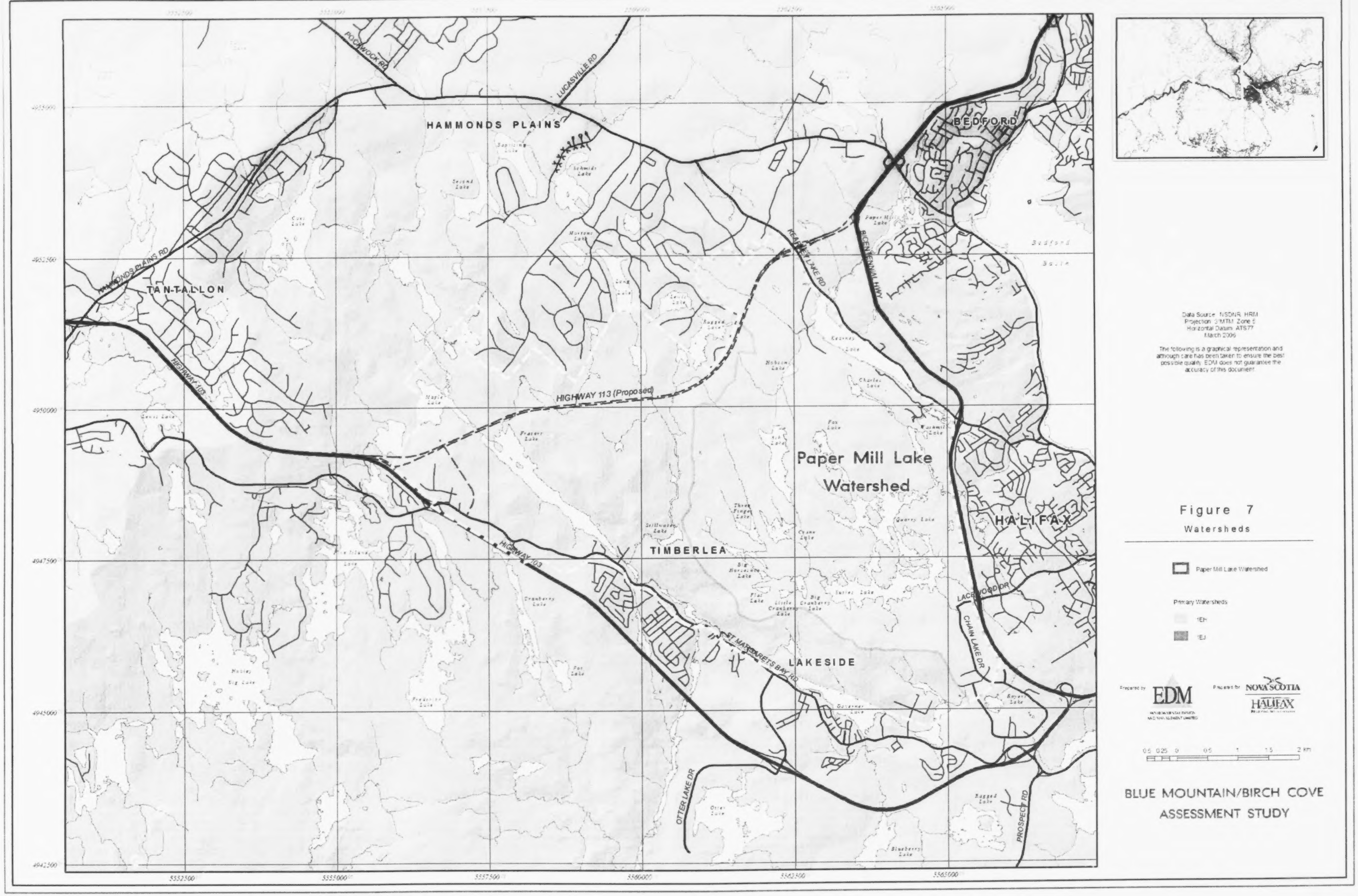

HAMMONDS PLAINS
BEDFORD
TANTALLON
HIGHWAY 113 (Proposed)
TIMBERLEA
HALIFAX
LAKESIDE
Steep Slope
Wetlands
Landform
Basal Moraine
Basal Moraine Flat Bog
Basal Moraine Rockland
Basal Moraine Undifferentiated
Flat Bog
Rockland
Rockland Flat Bog
Swamp
Urban
Drumlinoid Till Plain
Animal Collisions
EDM
NOVA SCOTIA
HALIFAX

Figure 6

Landscape Features

BLUE MOUNTAIN/BIRCH COVE ASSESSMENT STUDY


HAMMONDS PLAINS
BEDFORD
TANTALLON
HALIFAX
TIMBERLEA
LAKESIDE
Paper Mill Lake Watershed
Bedford Basin
POCKWOCK RD
LUCASVILLE RD
HAMMONDS PLAINS RD
HIGHWAY 103
HIGHWAY 113 (Proposed)
KEARNEY LAKE RD
BICENTENNIAL HWY
ST MARGARETS BAY RD
LACEWOOD DR
CHAIN LAKE DR
OTTER LAKE DR
PROSPECT RD
Paper Mill Lake
Kearney Lake
Charles Lake
Quarry Lake
Three Finger Lake
Stillwater Lake
Big Horseshoe Lake
Flat Lake
Little Cranberry Lake
Big Cranberry Lake
Governor Lake
Ragged Lake
Otter Lake
Blueberry Lake
Cranberry Lake
Fox Lake
Frasers Lake
Maple Lake
Long Lake
Second Lake
Schmidt Lake
Hobsons Lake
Big Lake
4955000
4952500
4950000
4947500
4945000
4942500
5552500
5555000
5557500
5560000
5562500
5565000
Paper Mill Lake Watershed
Primary Watersheds
1EH
1EJ
0.5 0.25 0 0.5 1 1.5 2 km

Data Source: NSDNR, HRM
Projection: 3°MTM, Zone 5
Horizontal Datum: ATS77
March 2006

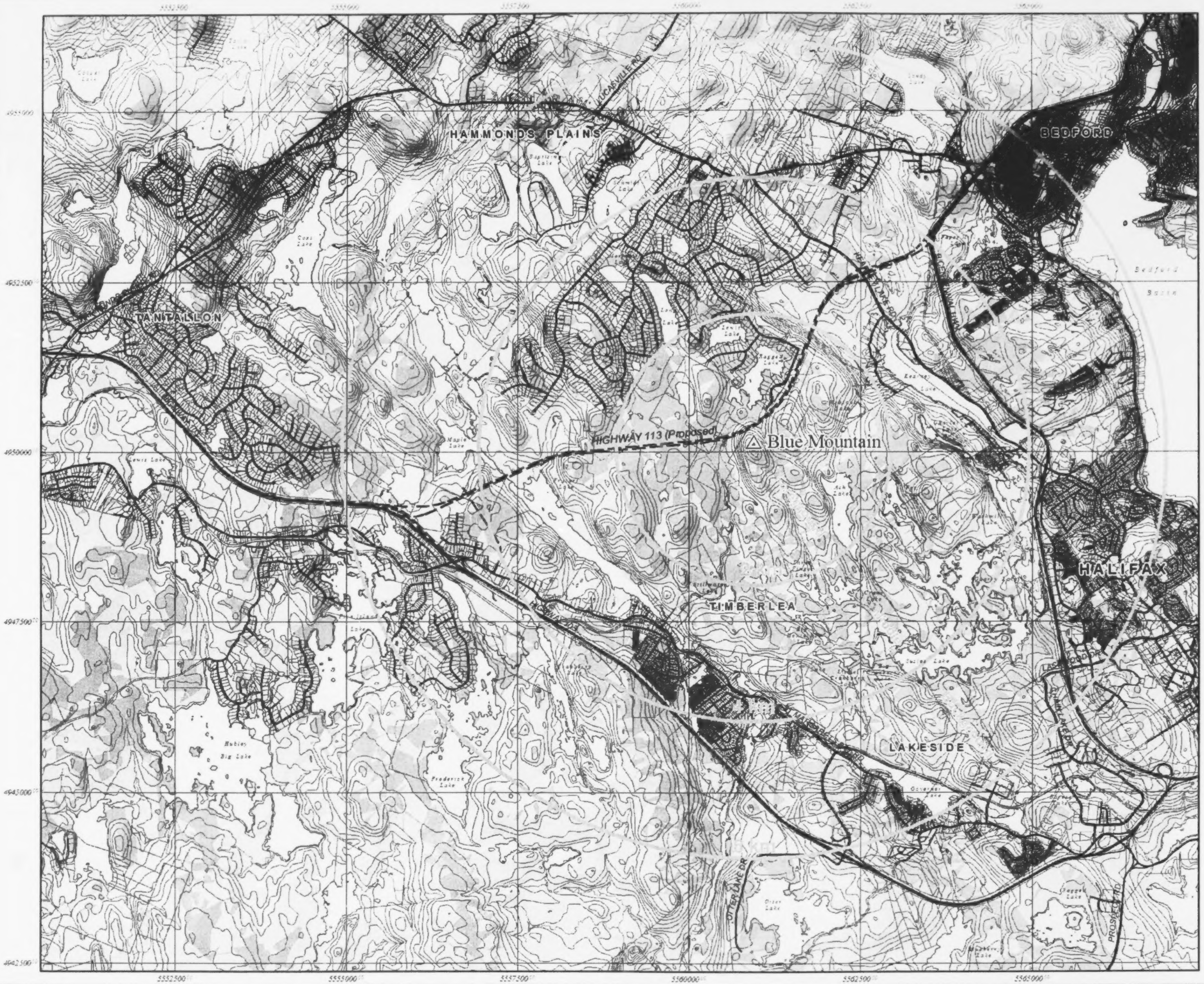
The following is a graphical representation and although care has been taken to ensure the best possible quality, EDM does not guarantee the accuracy of this document.

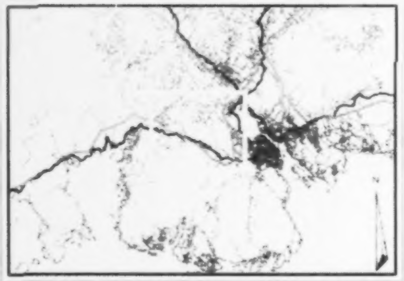
Figure 7
Watersheds

Prepared by EDM ENVIRONMENTAL DESIGN AND MANAGEMENT LIMITED

Prepared for NOVA SCOTIA HALIFAX REGIONAL MUNICIPALITY

BLUE MOUNTAIN/BIRCH COVE
ASSESSMENT STUDY


5552500
5555000
5557500
5560000
5562500
5565000
4955000
4952500
4950000
4947500
4945000
4942500
HAMMONDS PLAINS
BEDFORD
TANTALLON
Bedford Basin
HIGHWAY 113 (Proposed)
△ Blue Mountain
TIMBERLEA
HALIFAX
LAKESIDE
Hubley Big Lake
Frederick Lake
Otter Lake



Data Source: EDM, HRM
Projection: 3°MTM, Zone 5
Horizontal Datum: ATS77
March 2006

Figure 8A

Blue Mountain Viewshed Analysis

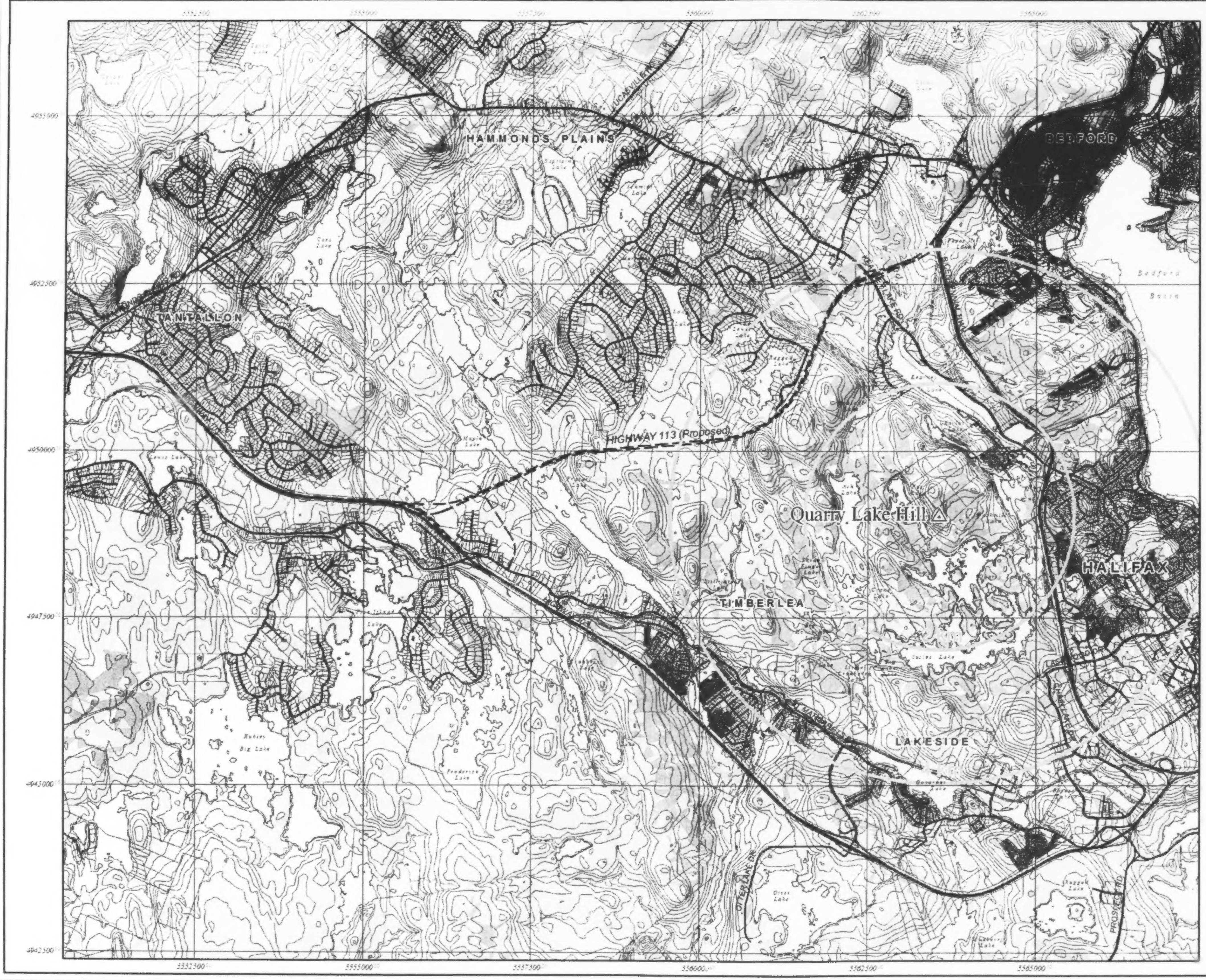
▭ Not Visible
▭ Visible

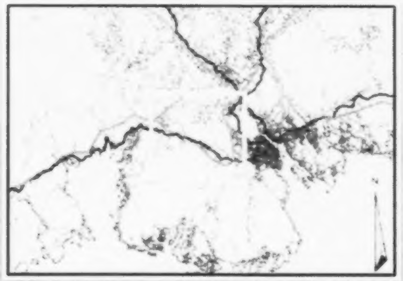
Prepared by EDM ENVIRONMENTAL DESIGN AND MANAGEMENT LIMITED

Prepared for NOVA SCOTIA HALIFAX REGIONAL MUNICIPALITY

0.5 0.25 0 0.5 1 1.5 2 km

BLUE MOUNTAIN/BIRCH COVE
ASSESSMENT STUDY


HAMMONDS PLAINS
BEDFORD
Bedford Basin
TANTALLON
HIGHWAY 113 (Proposed)
Quarry Lake Hill △
TIMBERLEA
HALIFAX
LAKESIDE
Maple Lake
Big Lake
Frederick Lake
Governor Lake
Kearney Lake
Otter Lake
Sheldrake Lake
4955000
4952500
4950000
4947500
4945000
4942500
5552500
5555000
5557500
5560000
5562500
5565000



Data Source: EDM, HRM
Projection: 3°MTM, Zone 5
Horizontal Datum: ATS77
March 2006

Figure 8B

Quarry Lake Hill Viewshed Analysis

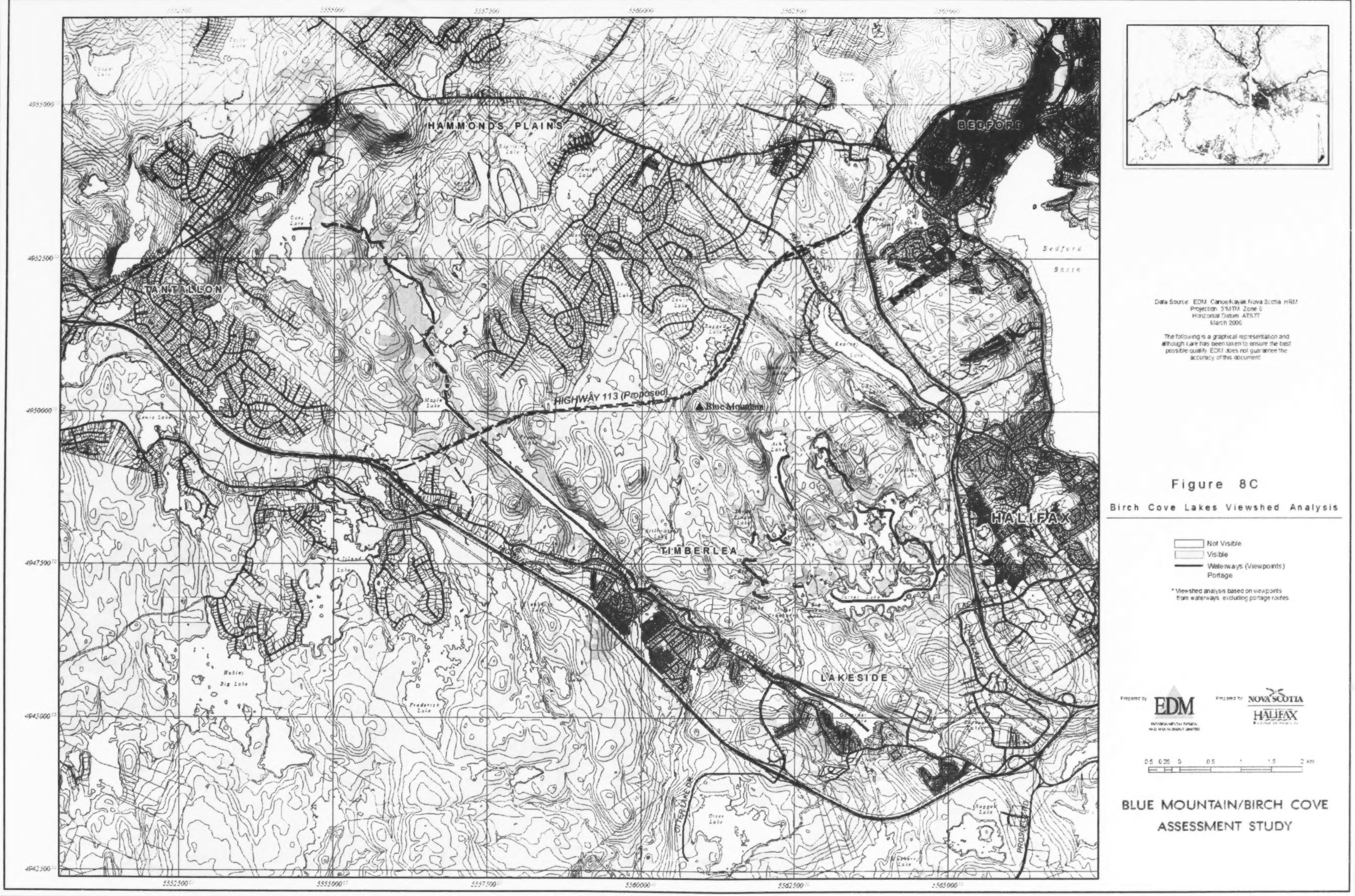
☐	Not Visible
☐	Visible

Prepared by: EDM ENVIRONMENTAL DESIGN AND MANAGEMENT LIMITED

Prepared for: NOVA SCOTIA HALIFAX REGIONAL MUNICIPALITY

0.5 0.25 0 0.5 1 1.5 2 km

BLUE MOUNTAIN/BIRCH COVE ASSESSMENT STUDY


HAMMONDS PLAINS
BEDFORD
Bedford Basin
TANTALLON
HIGHWAY 113 (Proposed)
Blue Mountain
Maple Lake
HALIFAX
TIMBERLEA
LAKESIDE
Hubley Big Lake
Frederick Lake
Otter Lake
5552500
5555000
5557500
5560000
5562500
5565000
4955000
4952500
4950000
4947500
4945000
4942500

Data Source EDM Canoe/Kayak Nova Scotia HRM
Projection 3°MTM Zone 5
Horizontal Datum ATS77
March 2006

The following is a graphical representation and although care has been taken to ensure the best possible quality EDM does not guarantee the accuracy of this document

Figure 8C

Birch Cove Lakes Viewshed Analysis

☐	Not Visible
▨	Visible
━	Waterways (Viewpoints) Portage

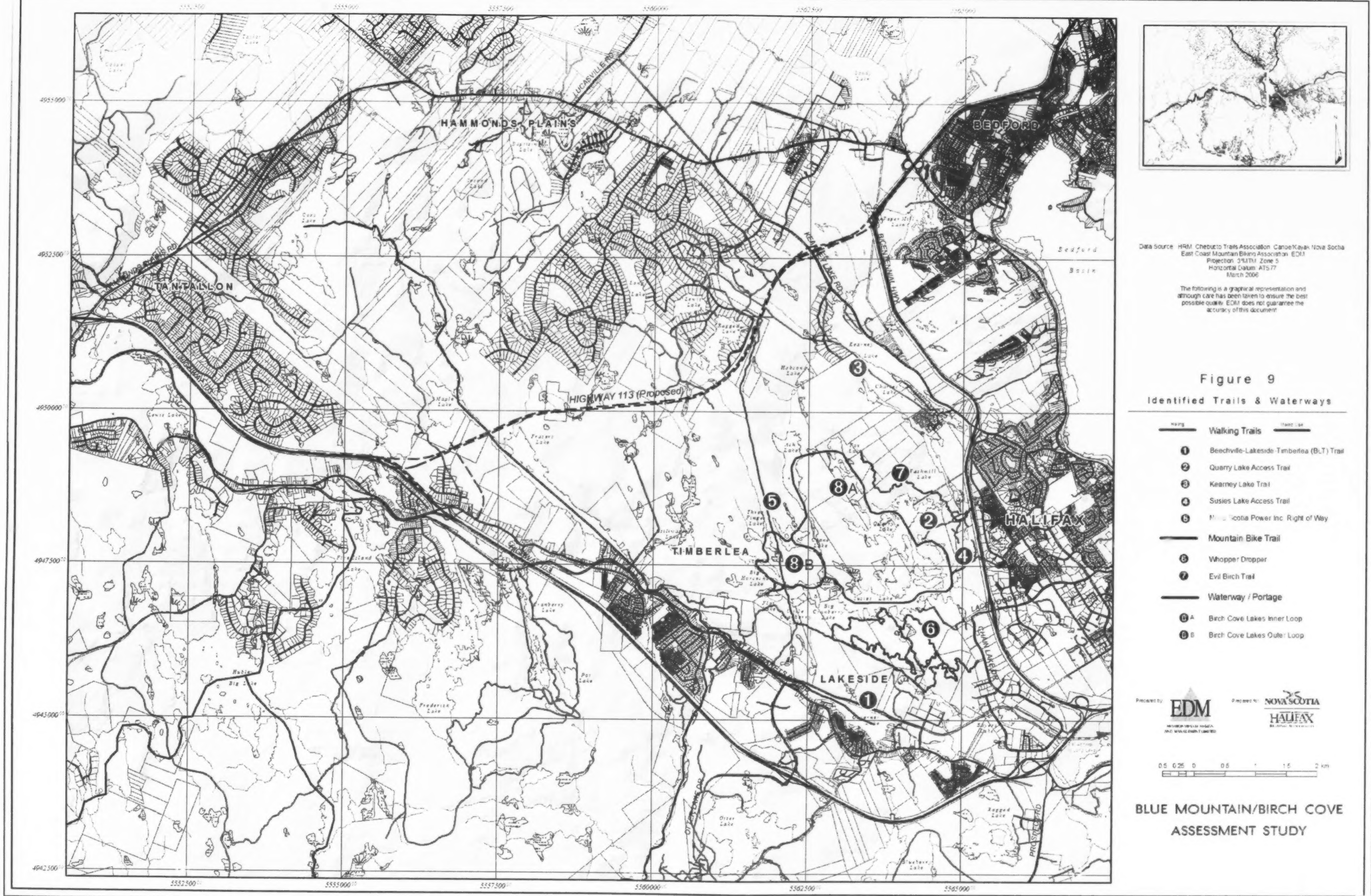
* Viewshed analysis based on viewpoints from waterways excluding portage routes

Prepared by EDM

Prepared for NOVA SCOTIA HALIFAX

0.5 0.25 0 0.5 1 1.5 2 km

BLUE MOUNTAIN/BIRCH COVE ASSESSMENT STUDY


HAMMONDS PLAINS
BEDFORD
TANTALLON
TIMBERLEA
LAKESIDE
HALIFAX
HIGHWAY 113 (Proposed)
Bedford Basin
1
2
3
4
5
6
7
8A
8B
4955000
4952500
4950000
4947500
4945000
4942500
5552500
5555000
5557500
5560000
5562500
5565000

Data Source: HRM, Chebucto Trails Association, Canoe/Kayak Nova Scotia
East Coast Mountain Biking Association, EDM
Projection: 3°MTM Zone 5
Horizontal Datum: ATS77
March 2006

The following is a graphical representation and although care has been taken to ensure the best possible quality, EDM does not guarantee the accuracy of this document.

Figure 9

Identified Trails & Waterways

Hiking — Walking Trails — Mixed Use

- ❶ Beechville-Lakeside-Timberlea (BLT) Trail
- ❷ Quarry Lake Access Trail
- ❸ Kearney Lake Trail
- ❹ Susies Lake Access Trail
- ❺ Nova Scotia Power Inc. Right of Way

Mountain Bike Trail

- ❻ Whopper Dropper
- ❼ Evil Birch Trail

Waterway / Portage

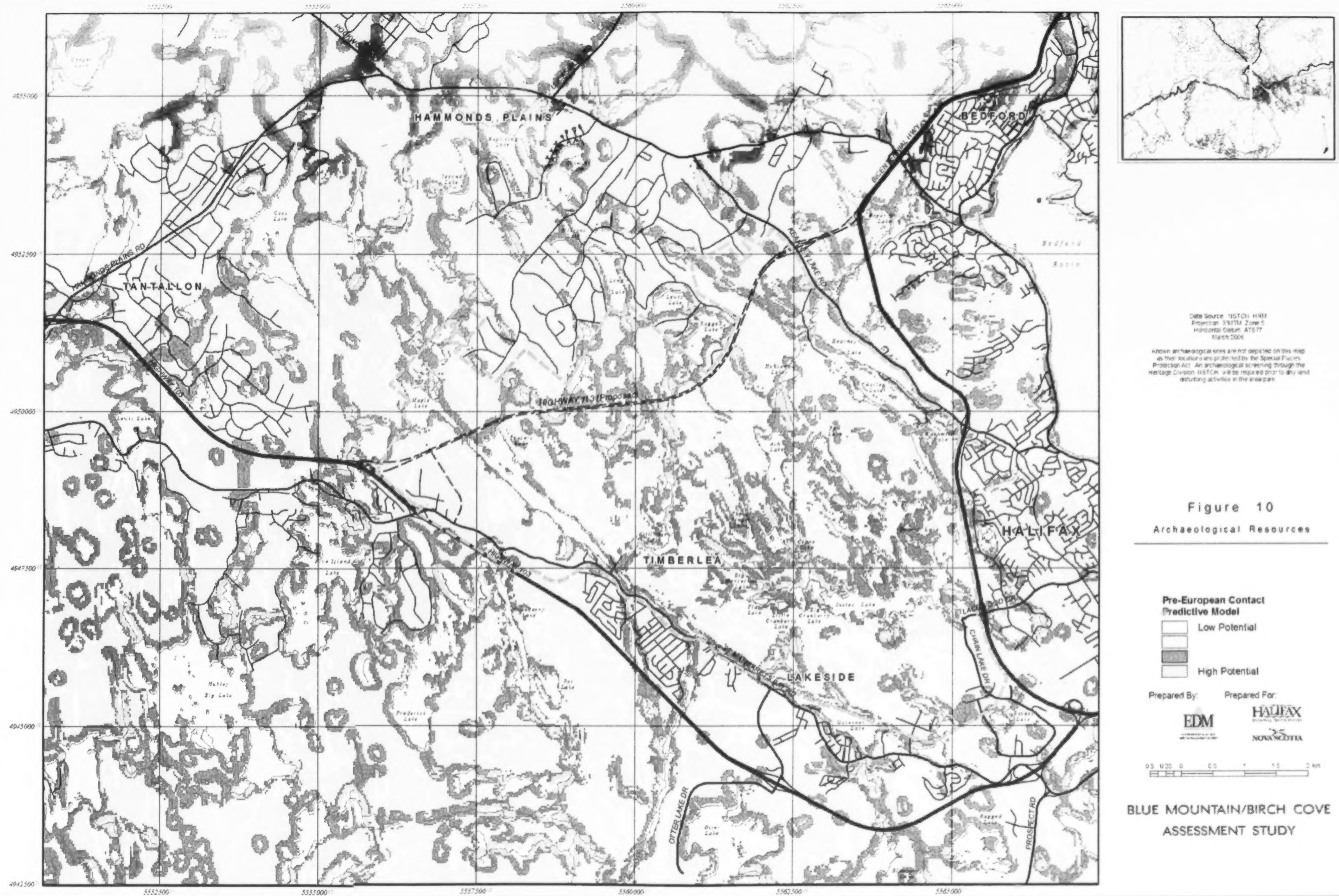
- ❽A Birch Cove Lakes Inner Loop
- ❽B Birch Cove Lakes Outer Loop

Prepared by: EDM

Prepared for: NOVA SCOTIA HALIFAX

0.5 0.25 0 0.5 1 1.5 2 km

BLUE MOUNTAIN/BIRCH COVE ASSESSMENT STUDY


HAMMONDS PLAINS
BEDFORD
TANTALLON
HAMMONDS PLAINS RD
HIGHWAY 103
HIGHWAY 113 (Proposed)
KEARNEY LAKE RD
BICENTENNIAL HWY
Bedford Basin
HALIFAX
TIMBERLEA
LAKESIDE
LACEWOOD DR
CHAIN LAKE DR
OTTER LAKE DR
PROSPECT RD
Five Island Lake
Hubley Big Lake
Frederick Lake
Maple Lake
Otter Lake
Kearney Lake
Governor Lake
5552500
5555000
5557500
5560000
5562500
5565000
4955000
4952500
4950000
4947500
4945000
4942500

Data Source: NSTCH, HRM
Projection: 3°MTM, Zone 5
Horizontal Datum: ATS77
March 2006

Known archaeological sites are not depicted on this map as their locations are protected by the Special Places Protection Act. An archaeological screening through the Heritage Division, NSTCH, will be required prior to any land disturbing activities in the area park.

Figure 10

Archaeological Resources

Pre-European Contact Predictive Model

☐	Low Potential
☐	
▨	
☐	High Potential

Prepared By:

EDM

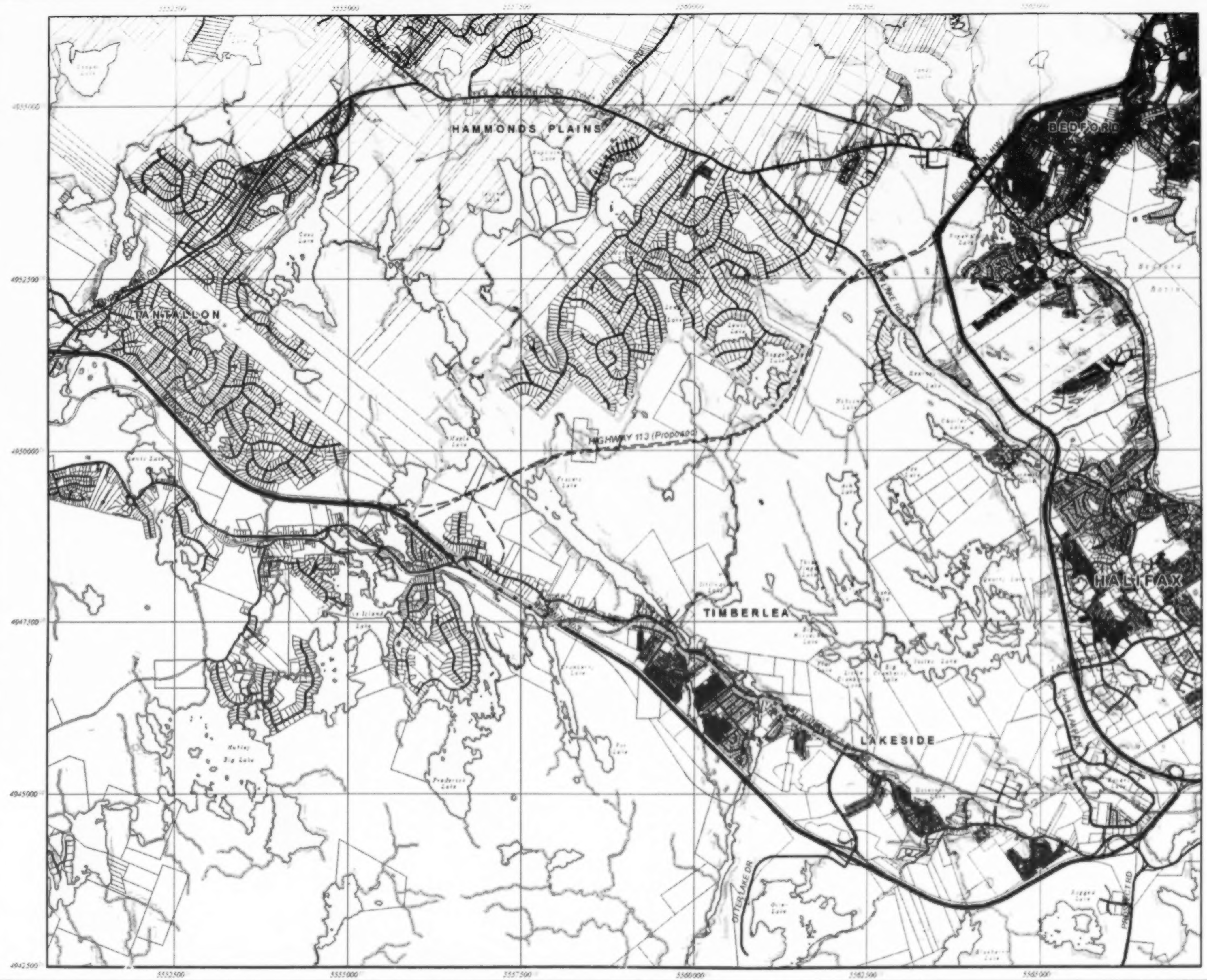
Prepared For:

HALIFAX

NOVA SCOTIA

0.5 0.25 0 0.5 1 1.5 2 km

BLUE MOUNTAIN/BIRCH COVE
ASSESSMENT STUDY


HAMMONDS PLAINS
BEDFORD
TANTALLON
HIGHWAY 113 (Proposed)
TIMBERLEA
LAKESIDE
HALIFAX
OTTER LAKE DR
PROSPECT RD
LUCASVILLE RD
5552500
5555000
5557500
5560000
5562500
5565000
4955000
4952500
4950000
4947500
4945000
4942500

Data Source: EDM, HRM
Projection: MTM Zone 5
Horizontal Datum: ATS77
March 2006

Figure 11

Water Protection

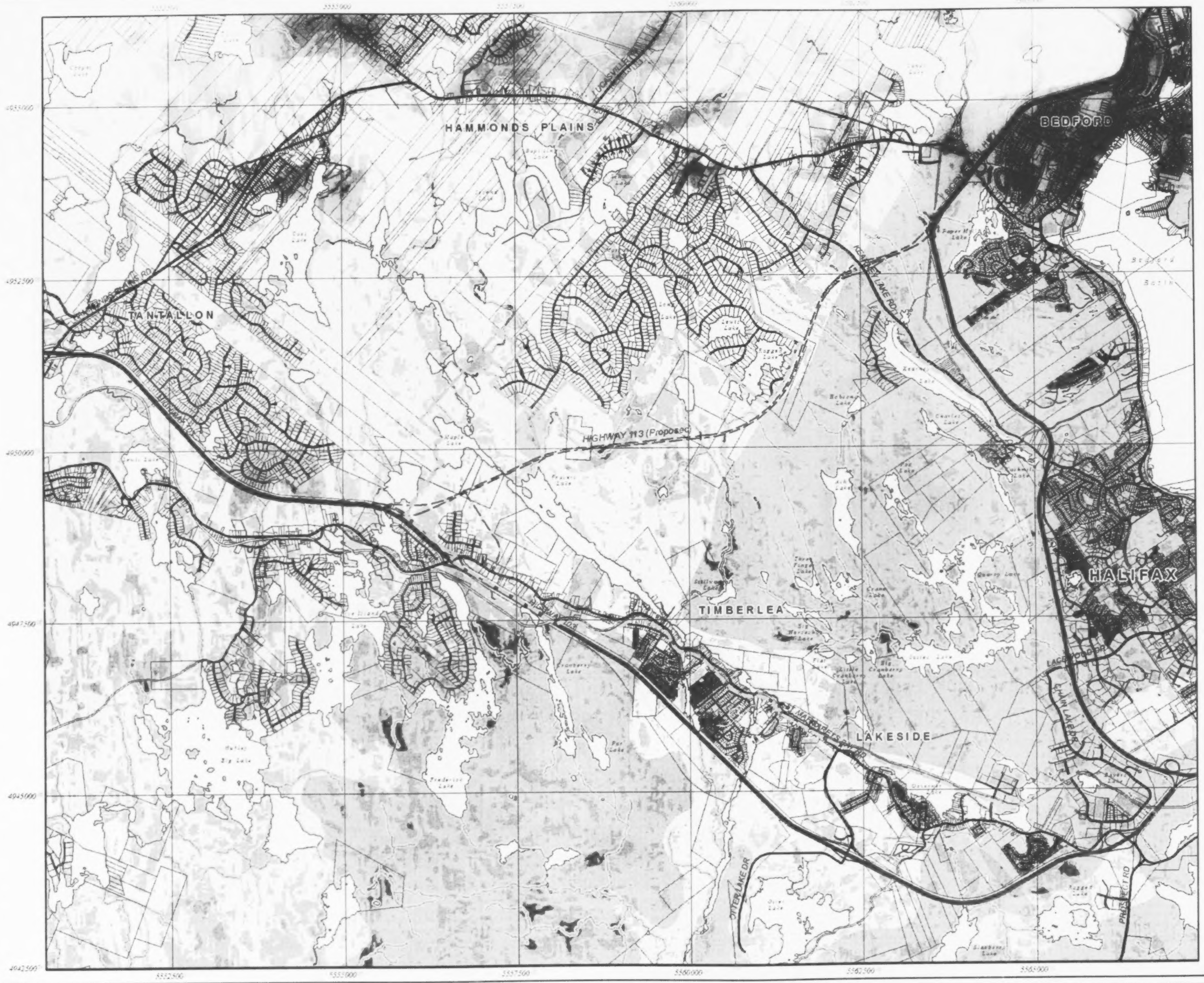
☐ Least Sensitive
☐
☐
☐
☐ Most Sensitive
☐ 30m Buffer

Prepared By: EDM

Prepared For: HALIFAX NOVA SCOTIA

0.5 0.25 0 0.5 1 1.5 2 km

BLUE MOUNTAIN/BIRCH COVE
ASSESSMENT STUDY


HAMMONDS PLAINS
BEDFORD
TANTALLON
HIGHWAY 113 (Proposed)
KEARNEY LAKE RD
Bedford Basin
TIMBERLEA
LAKESIDE
HALIFAX
LACEWOOD DR
CHAIN LAKE DR
OTTER LAKE DR
PROSPECT RD
4955000
4952500
4950000
4947500
4945000
4942500
5552500
5555000
5557500
5560000
5562500
5565000

Data Source: EDM, HRM
Projection: 3°MTM, Zone 5
Horizontal Datum: ATS77
March 2006

Figure 12
Unserviced
Residential Suitability

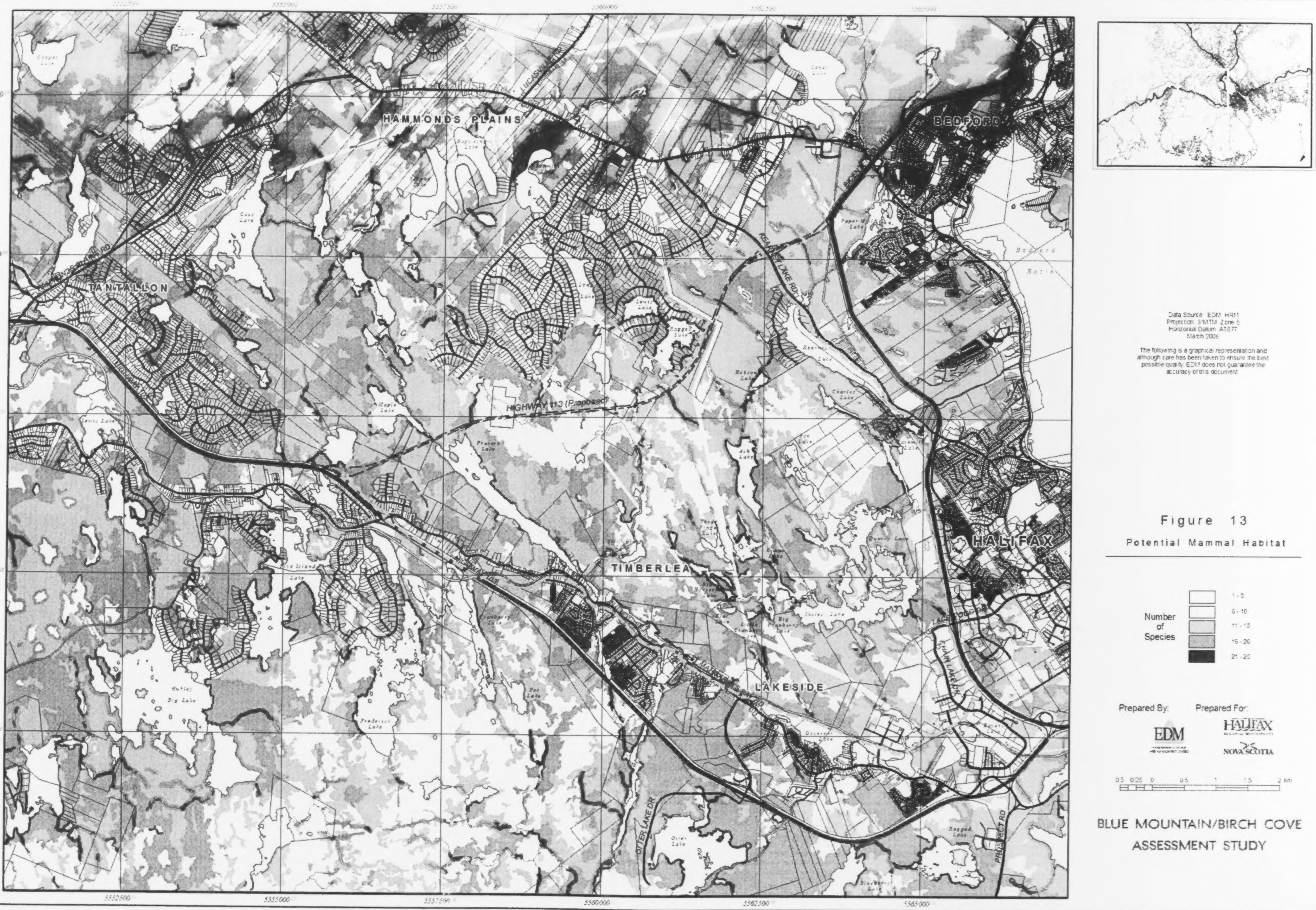
- ☐ High Potential
- ☐
- ▨
- ▨
- ■ Low Potential
- ☐ 30m Watercourse Buffer

Prepared By: EDM

Prepared For: HALIFAX NOVA SCOTIA

0.5 0.25 0 0.5 1 1.5 2 km

BLUE MOUNTAIN/BIRCH COVE
ASSESSMENT STUDY


HAMMONDS PLAINS
BEDFORD
TANTALLON
HIGHWAY 113 (Proposed)
HALIFAX
TIMBERLEA
LAKESIDE
KEARNEY LAKE RD
OTTER LAKE DR
PROSPECT RD
Bedford Basin
Number of Species
1 - 5
6 - 10
11 - 15
16 - 20
21 - 25
0.5 0.25 0 0.5 1 1.5 2 km
4955000
4952500
4950000
4947500
4945000
4942500
5552500
5555000
5557500
5560000
5562500
5565000

Data Source: EDM, HRM
Projection: 3°MTM, Zone 5
Horizontal Datum: ATS77
March 2006

The following is a graphical representation and although care has been taken to ensure the best possible quality EDM does not guarantee the accuracy of this document

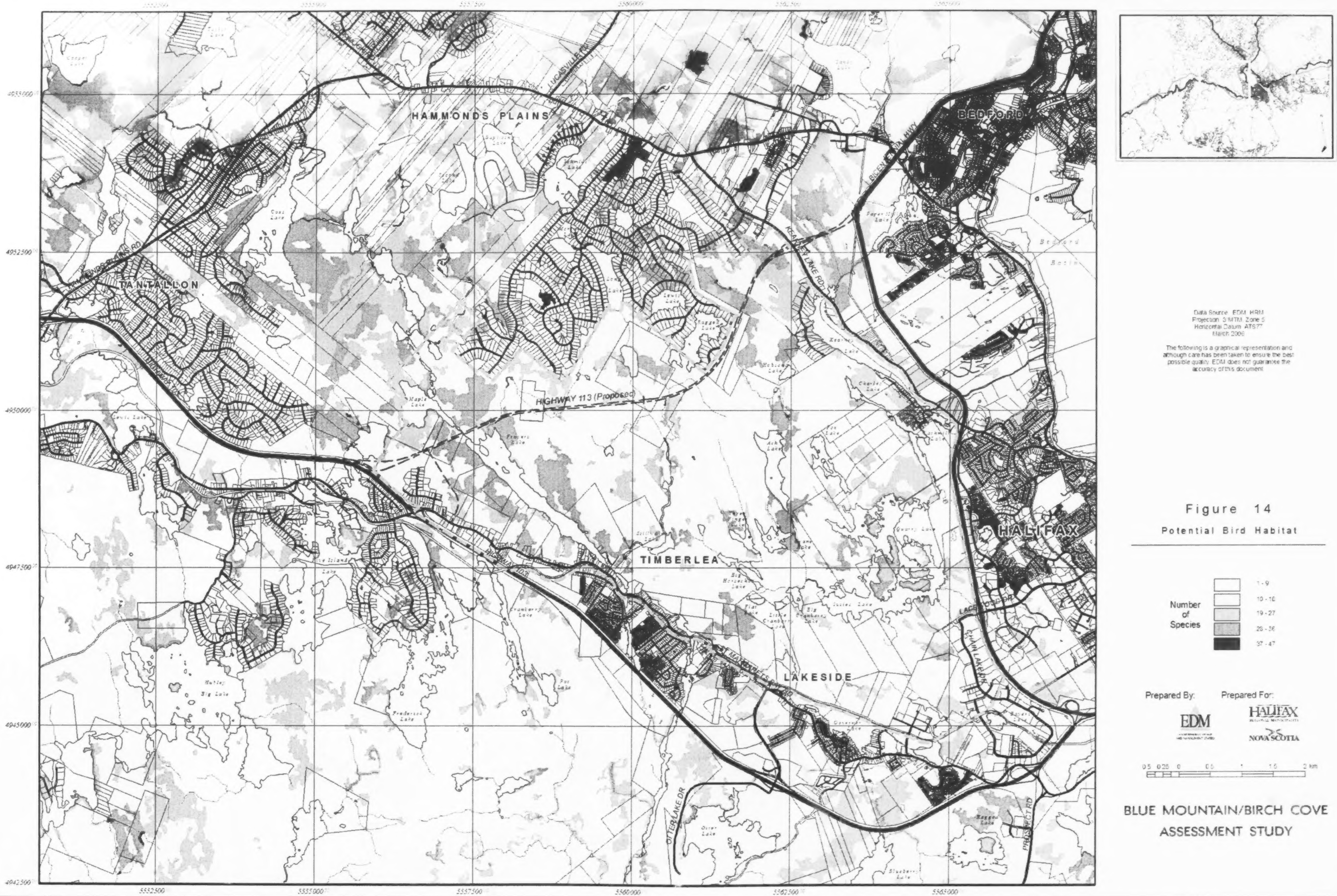
Figure 13

Potential Mammal Habitat

Prepared By: EDM

Prepared For: HALIFAX REGIONAL MUNICIPALITY, NOVA SCOTIA

BLUE MOUNTAIN/BIRCH COVE ASSESSMENT STUDY


HAMMONDS PLAINS
TANTALLON
BEDFORD
HALIFAX
TIMBERLEA
LAKESIDE
HIGHWAY 113 (Proposed)
LUCASVILLE RD
KEARNEY LAKE RD
OTTER LAKE DR
PROSPECT RD
Bedford Basin
Number of Species
1 - 9
10 - 18
19 - 27
28 - 36
37 - 47
0.5 0.25 0 0.5 1 1.5 2 km
4955000
4952500
4950000
4947500
4945000
4942500
5532500
5535000
5537500
5560000
5562500
5565000

Data Source: EDM, HRM
Projection: 3 MTM, Zone 5
Horizontal Datum: ATS77
March 2006

The following is a graphical representation and although care has been taken to ensure the best possible quality, EDM does not guarantee the accuracy of this document.

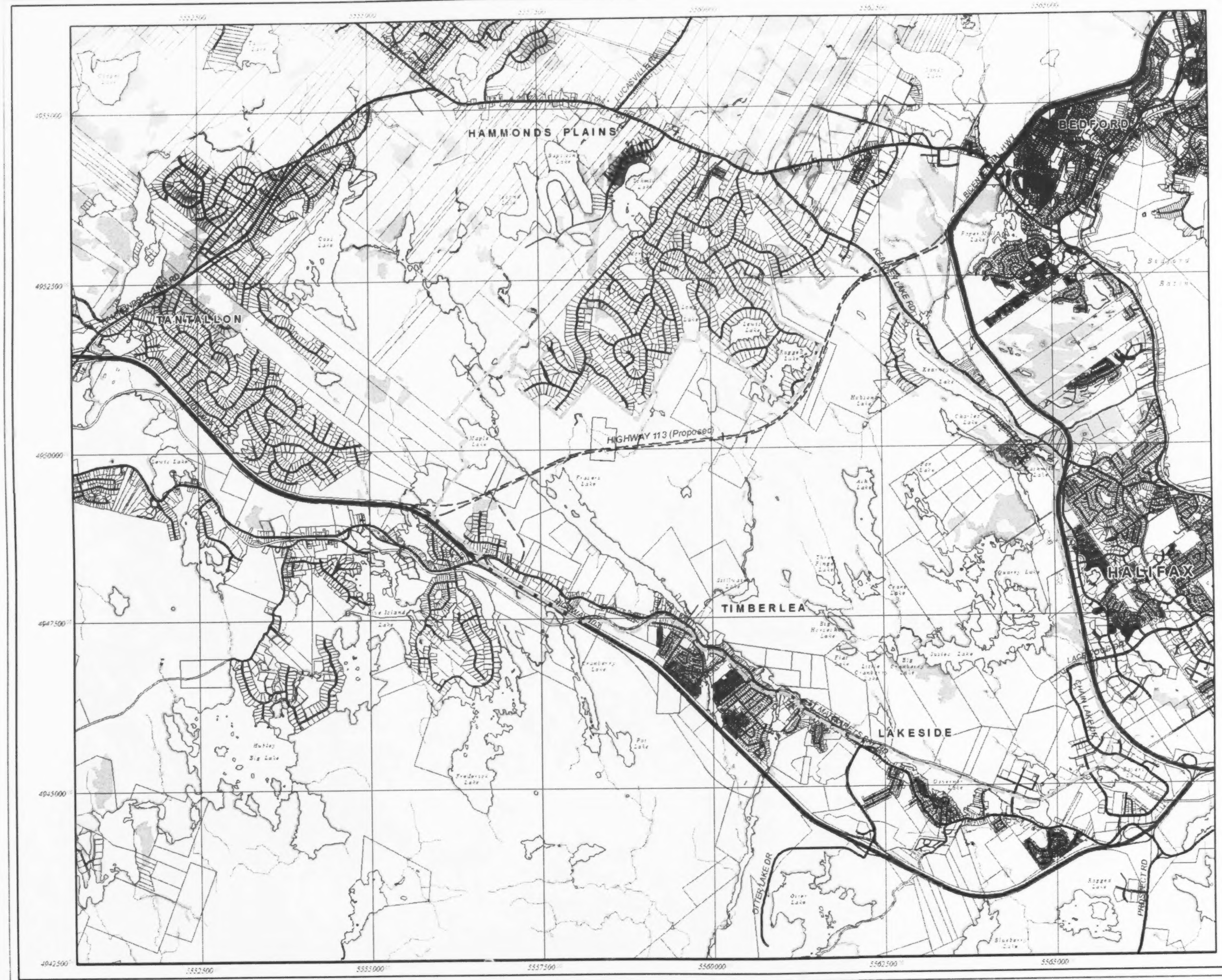
Figure 14

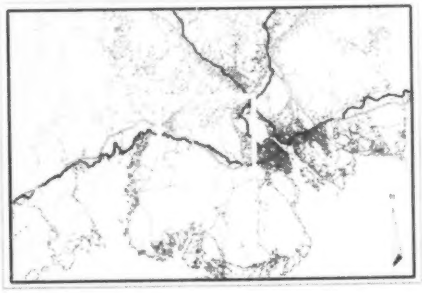
Potential Bird Habitat

Prepared By: EDM

Prepared For: HALIFAX REGIONAL MUNICIPALITY, NOVA SCOTIA

BLUE MOUNTAIN/BIRCH COVE ASSESSMENT STUDY


HAMMONDS PLAINS
LUCASVILLE RD
BEDFORD
BICENTENNIAL HWY
KEARNEY LAKE RD
Bedford
Basin
TANTALLON
HIGHWAY 113 (Proposed)
HALIFAX
TIMBERLEA
LAKESIDE
ST MARGARETS BAY RD
LACEWOOD DR
CHAIN LAKE DR
OTTER LAKE DR
PROSPECT RD
Kearney Lake
Hobsons Lake
Maple Lake
Frasers Lake
Cranberry Lake
Five Island Lake
Three Finger Lake
Big Horseshoe Lake
Flat Lake
Little Cranberry Lake
Big Cranberry Lake
Oyster Lake
Quarry Lake
Ash Lake
Pot Lake
Frederick Lake
Otter Lake
Blueberry Lake
Governor Lake
Cox Lake
Lewis Lake
4952500
4950000
4947500
4945000
4942500
5552500
5555000
5557500
5560000
5562500
5565000



Data Source: EDM, HRM
Projection: 3°MTM, Zone 5
Horizontal Datum: ATS77
March 2006

The following is a graphical representation and although care has been taken to ensure the best possible quality, EDM does not guarantee the accuracy of this document.

Figure 15

Potential
Reptile/Amphibian Habitat

Number of Species

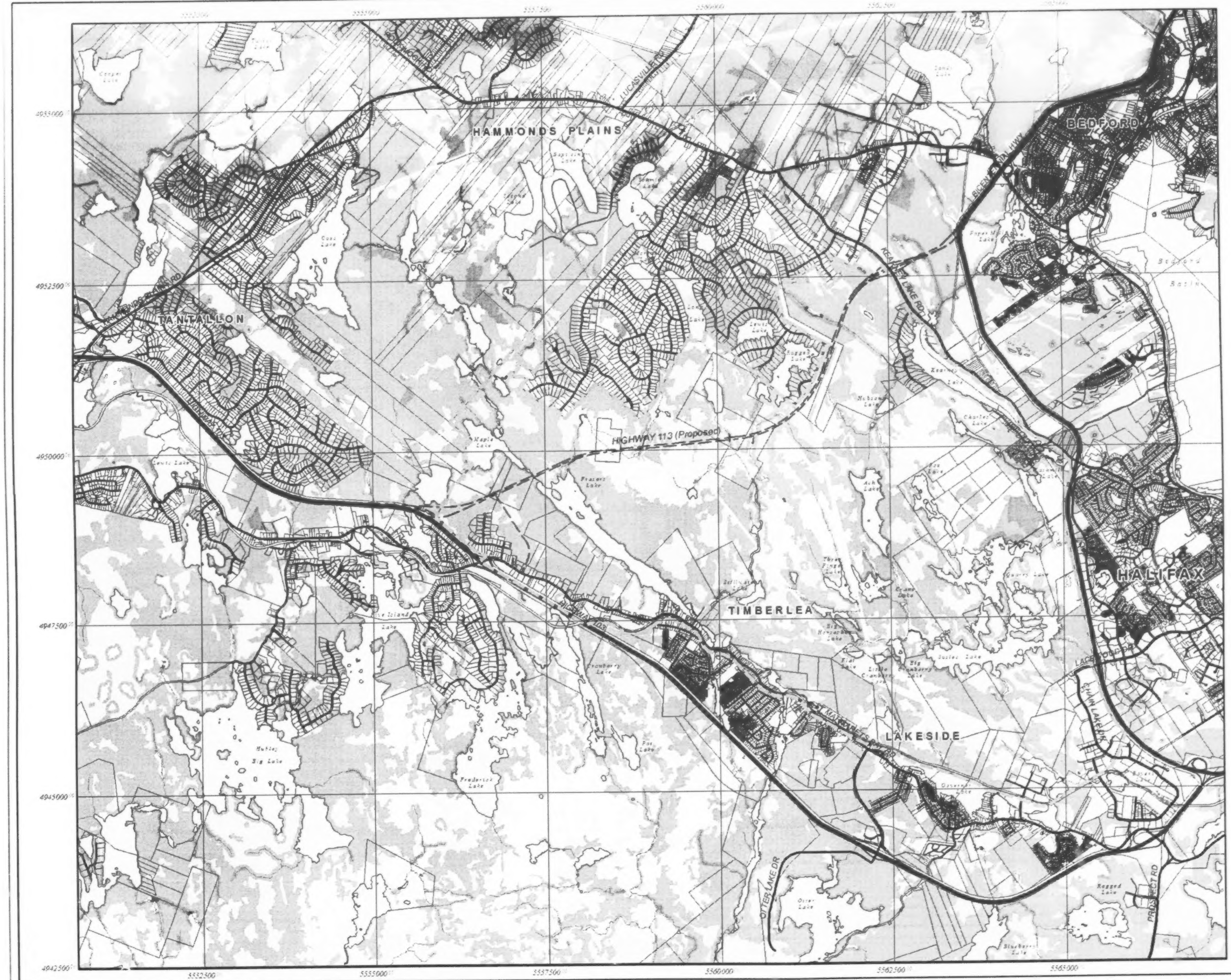
☐ 1 - 2
☐ 3 - 4
▨ 5 - 6
▨ 7 - 8
■ 9

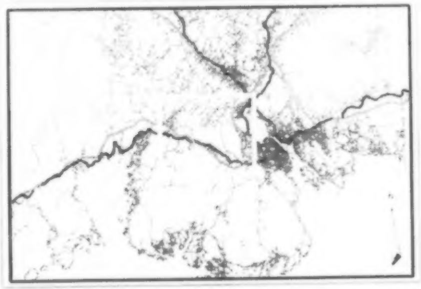
Prepared By: EDM

Prepared For: HALIFAX REGIONAL MUNICIPALITY, NOVA SCOTIA

0.5 0.25 0 0.5 1 1.5 2 km

BLUE MOUNTAIN/BIRCH COVE
ASSESSMENT STUDY


4955000
4952500
4950000
4947500
4945000
4942500
5552500
5555000
5557500
5560000
5562500
5565000
HAMMONDS PLAINS
BEDFORD
TANTALLON
HIGHWAY 113 (Proposed)
TIMBERLEA
HALIFAX
LAKESIDE
Bedford
Basin
Maple Lake
Frasers Lake
Cranberry Lake
Frederick Lake
Hubley Big Lake
Otter Lake
OTTER LAKE DR
Kearney Lake
Charles Lake
Ash Lake
Three Finger Lake
Quarry Lake
Cranberry Lake
Big Cranberry Lake
Little Cranberry Lake
Fox Lake
Governor Lake
Ragged Lake
Blueberry Lake
PROSPECT RD
KEARNEY LAKE RD
LACEWOOD DR
CHAIN LAKE DR
LUCASVILLE RD



Data Source: EDM, HRM
Projection: 3°MTM Zone 5
Horizontal Datum: ATS77
March 2006

The following is a graphical representation and although care has been taken to ensure the best possible quality, EDM does not guarantee the accuracy of this document.

Figure 16

Species Richness

Abundance of Species	
☐	Least
☐	
▨	
▨	
■	Most

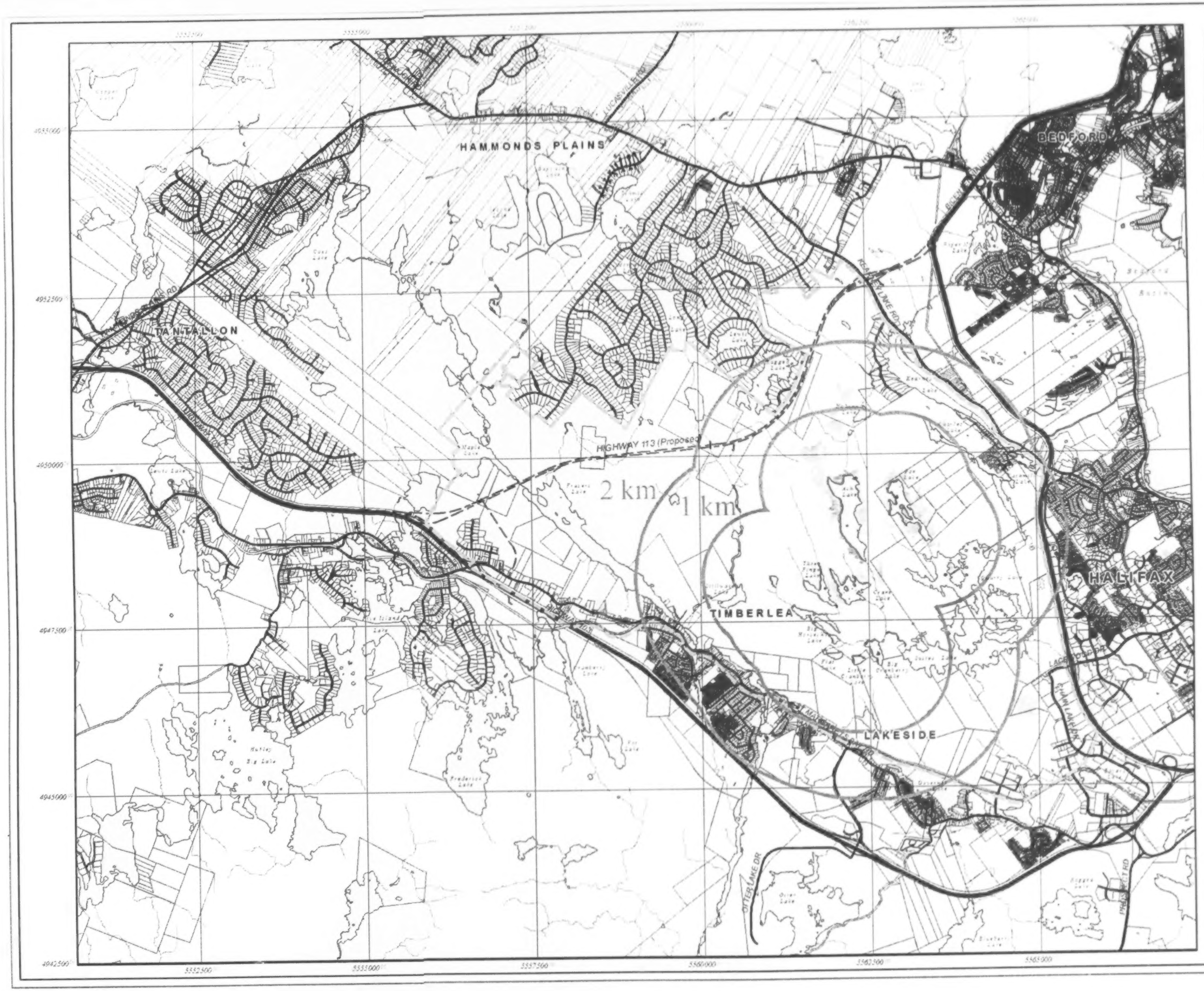
Note: Equal weight given to Mammals, Birds, and Amphibians

Prepared By:

Prepared For:

0.5 0.25 0 0.5 1 1.5 2 km

BLUE MOUNTAIN/BIRCH COVE
ASSESSMENT STUDY


HAMMONDS PLAINS
TANTALLON
BEDFORD
HIGHWAY 113 (Proposed)
2 km
1 km
TIMBERLEA
LAKESIDE
HALIFAX
4955000
4952500
4950000
4947500
4945000
4942500
3552500
3555000
3557500
3560000
3562500
3565000

Data Source: EDM, HRM
Projection: 3 MTM Zone 5
Horizontal Datum: ATS77
March 2006

Figure 17

Views From 'Core' Lakes

▭ Core Lake Buffers

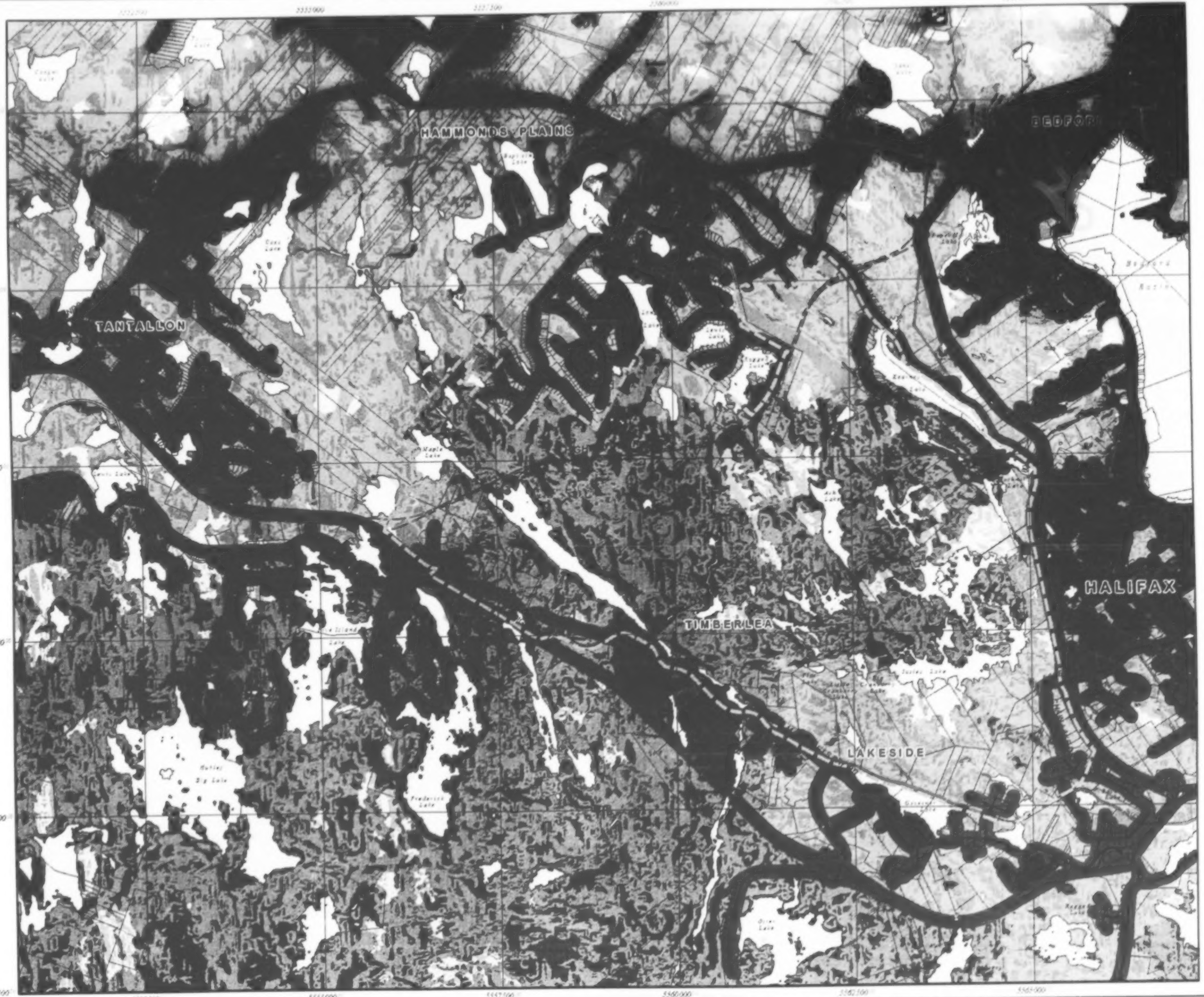
White = Not Visible
Light Green = Less Visible
Dark Green = More Visible

Prepared By: EDM

Prepared For: HALIFAX, NOVA SCOTIA

0.5 0.25 0 0.5 1 1.5 2 km

BLUE MOUNTAIN/BIRCH COVE
ASSESSMENT STUDY


HAMMONDS PLAINS
BEDFORD
TANTALLON
TIMBERLEA
LAKESIDE
HALIFAX
Bedford Basin
5552500
5555000
5557500
5560000
5562500
5565000
4955000
4952500
4950000
4947500
4945000
4942500

Data Source: EDM, HRM
Projection: 3TM, Zone 5
Horizontal Datum: ATS77
March 2006

The purpose of this model is to assess the raw potential of the landscape for active recreation. It is based upon the hiking model developed for NSTCH by EDM. Existing trails and other infrastructure are not considered.

Figure 18

Active Recreation Suitability

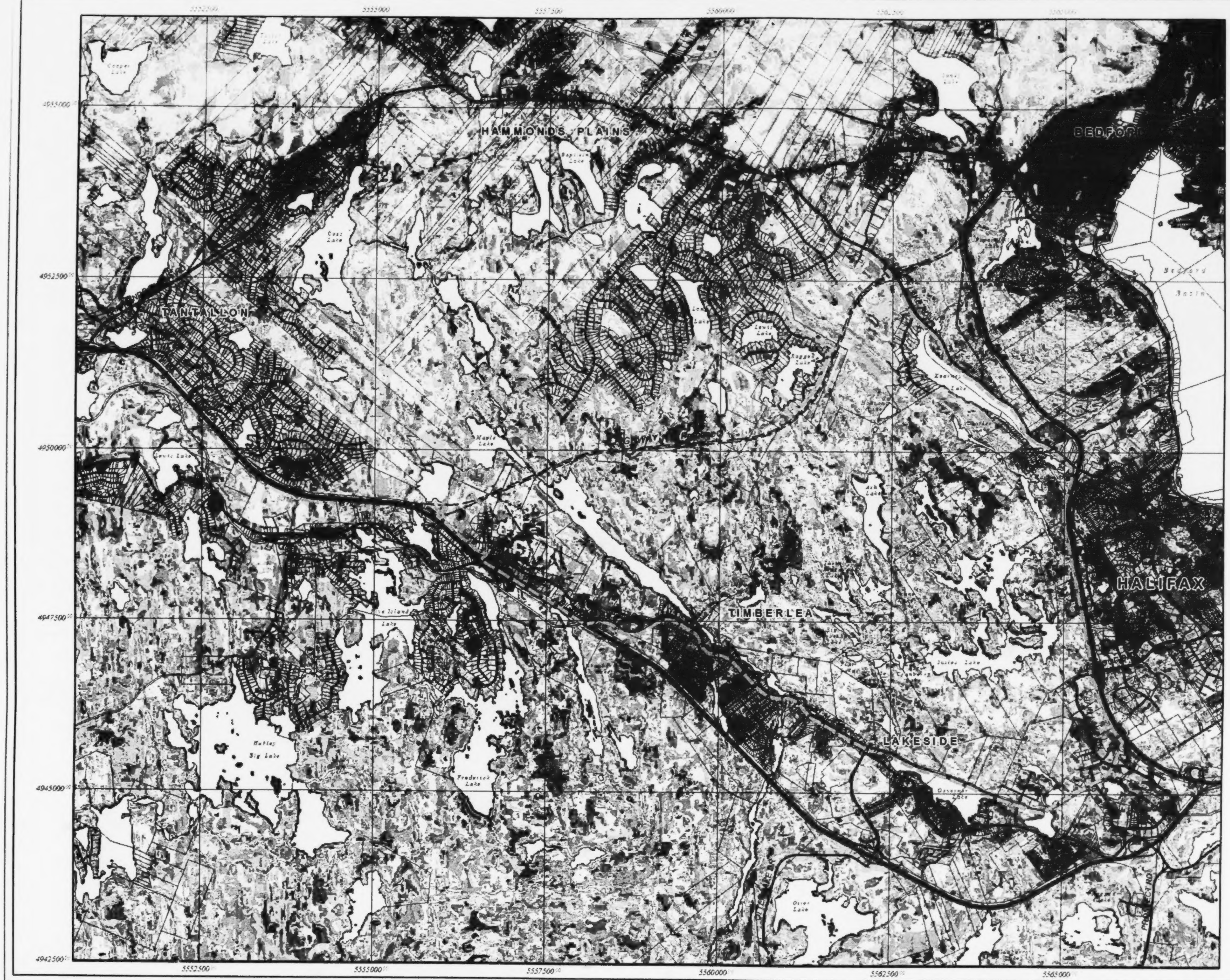
- ☐ High Potential
- ☐
- ▨
- ▨
- ■ Low Potential

Prepared By: EDM

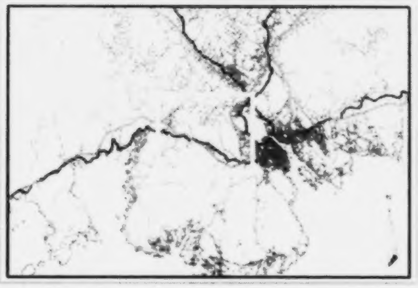
Prepared For: HALIFAX NOVA SCOTIA

0.5 0.25 0 0.5 1 1.5 2 km

BLUE MOUNTAIN/BIRCH COVE
ASSESSMENT STUDY



HAMMONDS PLAINS
BEDFORD
Bedford Basin
TANTALLON
HALIFAX
TIMBERLEA
LAKESIDE
Cooper Lake
Coxs Lake
Maple Lake
Ash Lake
Kearney Lake
Hubley Big Lake
Frederick Lake
Five Island Lake
Governor Lake
Otter Lake
4955000
4952500
4950000
4947500
4945000
4942500
5552500
5555000
5557500
5560000
5562500
5565000



Data Source: EDM, HRM
Projection: 3°MTM, Zone 5
Horizontal Datum: ATS77
March 2006

Figure 19

Model Composite

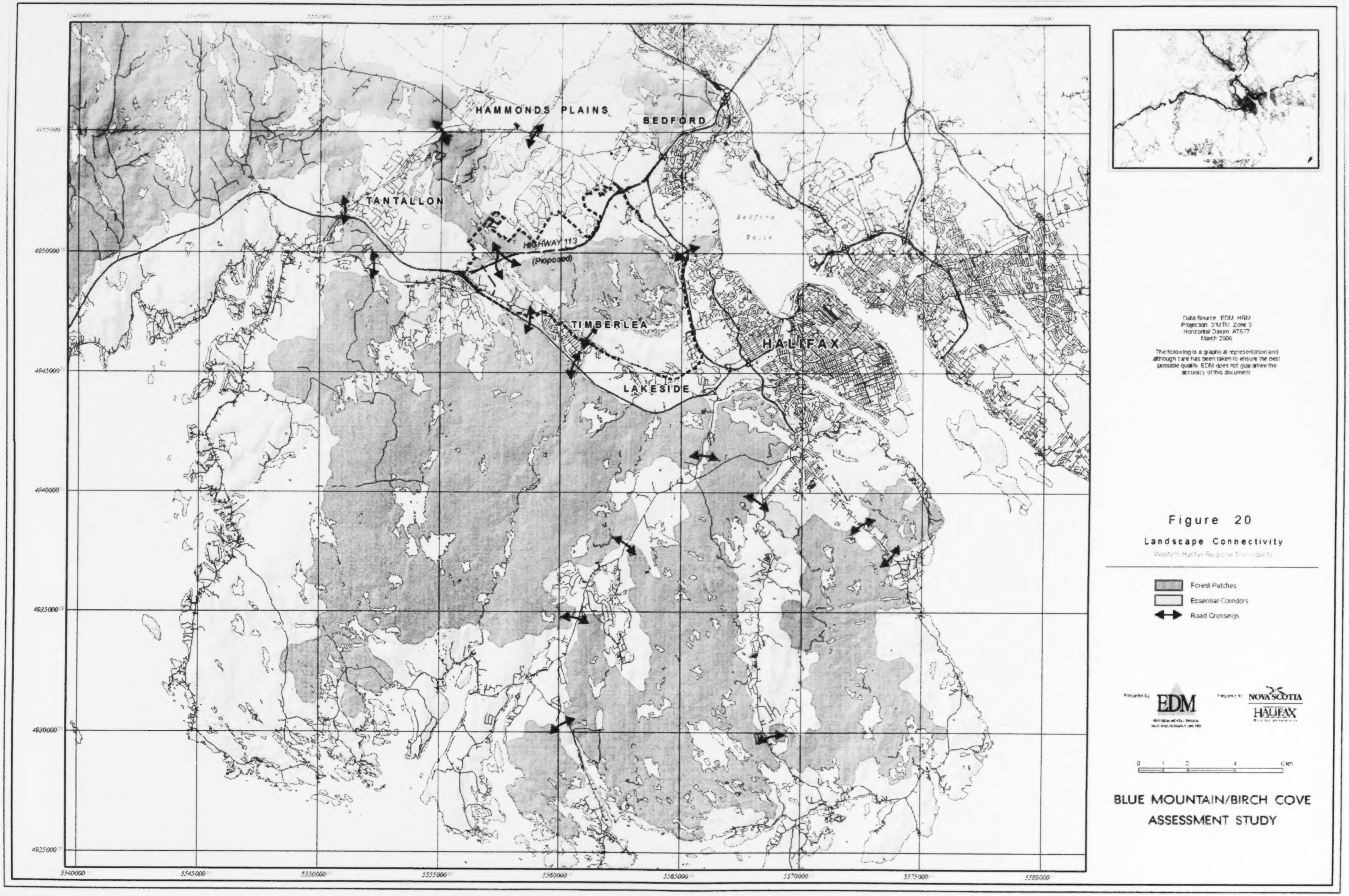
Yellows = Best
Greens = Mid
Blues/Purples = Worst

Prepared By: EDM

Prepared For: HALIFAX REGIONAL MUNICIPALITY, NOVA SCOTIA

0.5 0.25 0 0.5 1 1.5 2 km

BLUE MOUNTAIN/BIRCH COVE ASSESSMENT STUDY


HAMMONDS PLAINS
BEDFORD
TANTALLON
Bedford Basin
HIGHWAY 113 (Proposed)
TIMBERLEA
HALIFAX
LAKESIDE
5540000
5545000
5550000
5555000
5560000
5565000
5570000
5575000
5580000
4955000
4950000
4945000
4940000
4935000
4930000
4925000
0
1
2
4
6 km
Prepared by
EDM
Prepared for
NOVA SCOTIA
HALIFAX

Data Source EDM HRM
Projection 3°MTM Zone 5
Horizontal Datum ATS77
March 2006

The following is a graphical representation and although care has been taken to ensure the best possible quality EDM does not guarantee the accuracy of this document

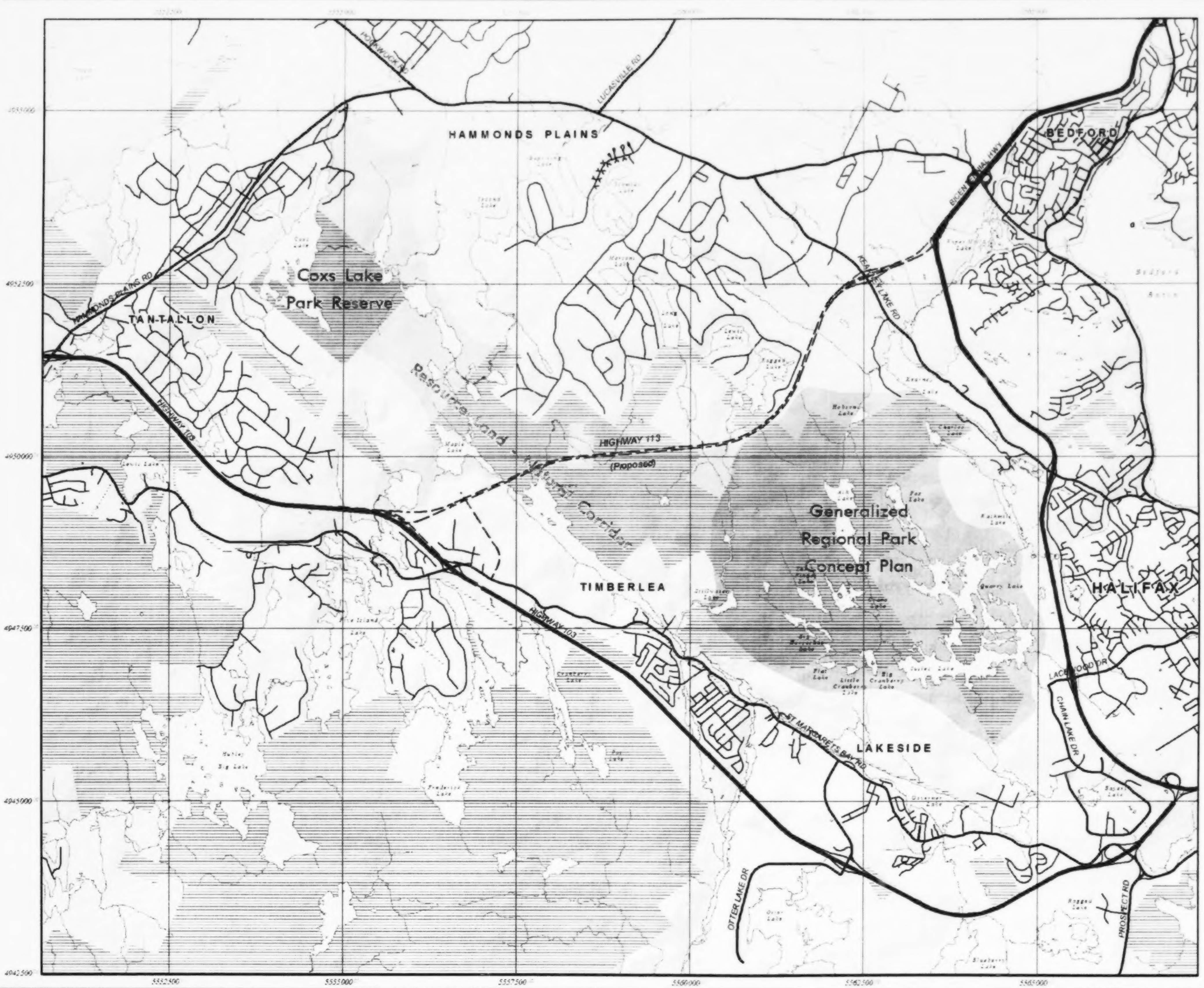
Figure 20

Landscape Connectivity

Western Halifax Regional Municipality

▨	Forest Patches
☐	Essential Corridors
↔	Road Crossings

BLUE MOUNTAIN/BIRCH COVE
ASSESSMENT STUDY


HAMMONDS PLAINS
BEDFORD
TANTALLON
Coxs Lake
Park Reserve
Resource Land - Natural Corridor
HIGHWAY 113
(Proposed)
Generalized
Regional Park
Concept Plan
TIMBERLEA
HALIFAX
LAKESIDE
HAMMONDS PLAINS RD
POCKWOCK RD
LUCASVILLE RD
KEARNEY LAKE RD
BICENTENNIAL HWY
HIGHWAY 103
ST MARGARETS BAY RD
LACEWOOD DR
CHAIN LAKE DR
OTTER LAKE DR
PROSPECT RD
Bedford Basin
Maple Lake
Kearney Lake
Quarry Lake
Flat Lake
Little Cranberry Lake
Big Cranberry Lake
Governor Lake
Frederick Lake
Otter Lake
Blueberry Lake
4955000
4952500
4950000
4947500
4945000
4942500
5552500
5555000
5557500
5560000
5562500
5565000

Data Source: EDM, NSDNR, HRM
Projection: 3°MTM, Zone 5
Horizontal Datum: ATS77
March 2006

This figure is a concept plan and should not be interpreted as a final design

Figure 21

Generalized Concept Plan

▨ Generalized Park Land
▨ Resource Lands/Natural Corridor
▤ Crown Land

Prepared by EDM Environmental Design and Management Limited

Prepared for NOVA SCOTIA HALIFAX Regional Municipality

0.5 0.25 0 0.5 1 1.5 2 km

BLUE MOUNTAIN/BIRCH COVE
ASSESSMENT STUDY

APPENDIX B: PROPERTY OWNERSHIP

Appendix B has been intentionally omitted.

APPENDIX C: INTERVIEW CONTACTS

Contact	Name(s)
HRM	
- Geographic Information Services	Jim Gannon
- Planning and Development	Angus Schaffenburg
- Planning and Development	Jim Donovan
- Planning and Development	Kelly Denty
- Planning and Development	Rosemary McNeil
- Public Works and Transportation	Dave McCusker
- Public Works and Transportation	*Roxanne MacInnes*
- Real Property and Asset Management	*Jan Skora*
- Real Property and Asset Management	*Peter Bigelow*
- Regional Planning	*John Charles*
- Tourism, Recreation and Culture	Carol Macomber
Province of Nova Scotia	
- Environment and Labour	David MacKinnon
- Natural Resources	*Hugh Gillis*
- Nova Scotia Museum	Bob Ogilvie
- Sport and Recreation Commission	Ted Scrutton
- Sport and Recreation Commission	Jody Conrad
- Tourism and Culture	Mary Jo
- Transportation and Public Works	*Gerald Parks*
- Transportation and Public Works	*Janice Harland*
Government of Canada	
- Environment Canada	Paul Chamberlain
Stakeholder Organizations	
- Bedford Watershed Advisory Board	Don Lowther
- Birch Cove Lakes Wilderness Society	Chris Miller
- BLT Rails to Trails	Cathy Kelfenz
- Canadian Nature Conservancy	Dr. Bill Freedman
- Canadian Parks and Wilderness Society - Nova Scotia Chapter	Dr. Martin Wiliston
- Canoe Kayak Nova Scotia	Dusan Soudek
- East Coast Mountain Biking	Sue Earle
- Ecology Action Centre Wilderness Committee	Raymond Plourde
- Five Bridge Wilderness Heritage Trust	Beth McGee
- Halifax Field Naturalists	Bob & Wendy MacDonald
- Northwest Trails Association	Bob & Wendy MacDonald
- Nova Scotia Nature Trust	Duncan Bayne
- Nova Scotia Trails Federation	Jim Vance
- Tourism Industry Association of Nova Scotia	Jennifer Westclough-MacLean
Landowners	
- Annapolis Basin Group	David Nantes
- Armco Communities / Kimberly-Lloyd Developments	Rob MacPherson
- Barrett Lumber Company	David Barrett
- Fraser Lakes Development	
- Gateway Quarry	
- Greater Homes	Louis deMontbrun
- John Fiske	John Fiske
- Sisters of Charity	Sister Joan O'Keefe

TERMS OF REFERENCE

FOR THE PREPARATION OF A

FOCUS REPORT

NOVA SCOTIA DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS

HIGHWAY 113
HALIFAX REGIONAL MUNICIPALITY, NOVA SCOTIA

NOVA SCOTIA DEPARTMENT OF ENVIRONMENT AND LABOUR

December 7, 2004

Introduction

The Highway 113 project proposed by Transportation and Public Works (TPW) was registered for environmental assessment as a Class 1 undertaking pursuant to Part IV of the Environment Act on May 2, 2001.

On May 25, 2001, the Minister Nova Scotia Department of Environment and Labour (NSEL), based on comments received on the project, decided that additional information was required from TPW, regarding: the impacts and mitigation strategies for zoological species-at-risk, species such as moose with large home ranges; and, wilderness recreation values of the Blue Mountain - Birch Cove Lakes area. More information was also required to provide further explanation as to how the proposed highway will function "as an effective block to development toward the much larger area south of the Kingswood subdivision" as claimed by the Proponent.

On September 7, 2004, the Nova Scotia Department of Transportation and Public Works (TPW) submitted Addendum # 2 Additional Information for the Proposed Highway 113.

On October 4, 2004, TPW withdrew the project in order to be able to construct the connector from Trunk 3 to Highway 113 (this was not part of the original EA trigger). The project was re-registered without the connector road on October 18, 2004.

On November 12, 2004, following a review of information submitted by the proponent, review agencies and the public, the Minister of NSEL decided that there may be limited adverse effects or significant environmental effects related to the proposal . In accordance with section 13(1)(c) of the Environmental Assessment Regulations, the Minister directed TPW to provide a focus report to examine how the proposed Highway 113 fits within the context of the current Halifax Regional Municipality's (HRM's) regional planning efforts, including but not limited to, consideration of parks and natural areas, recreational land-use, transportation corridors and private development.

The proponent is required to submit the Focus Report within one year of receipt of the Terms of Reference. Upon submission of the Focus Report by the proponent, NSEL has 12 days to publish a notice in the newspaper, that advises the public where the Focus Report can be accessed for review and comment. A 30 day public review period of the Focus Report follows.

At the conclusion of the 30 day public review, NSEL has 25 days to review public, government comments, and provide a Report and Recommendations to the Minister.

The Minister of Environment and Labour will have the following decision options, following the review of the focus report:

(S. 18) (a)
- i. the undertaking is approved subject to specified terms and conditions and any other approvals required by statute or regulation;
- ii. an environmental-assessment report is required; or
- iii. the undertaking is rejected.

The following concerns identified during the screening portion of the environmental assessment are presented to TPW for response in the form of a Focus Report.

1.0 Project Description

A description of Highway 113 including the following:
- the highway corridor location;
- the highway length and methods used to calculate the length;
- any assumptions which underlie the details of the project design, including impact avoidance opportunities; and
- the construction schedule.

2.0 Reason for the Undertaking

In recognition of the fact that the project has a potential to impact upon the environment and planned or existing land use in the area, this section shall discuss the public need for the undertaking.

3.0 Other Methods/Alternatives For Carrying Out the Undertaking

Describe other methods/alternatives for carrying out the undertaking, including the following:
- alternative route alignments;
- adjusting the median width;
- other modes of transportation;
- upgrading Hammonds Plains Road; and
- the null or "do nothing " alternative.

4.0 Description of HRM's Regional Planning Process

Describe HRM's planning process including the: scope; process; themes and opportunities for public participation, based on public documents and discussions with HRM staff.

5.0 Highway 113 within the context of HRM's Regional Plan

Describe how Highway 113 fits within the context of HRM's Regional Plan and examine options for integrated/ collaborative planning, in particular, as they relate to:

5.1 Transportation Corridors

Describe how, or to what extent, Highway 113 is consistent with HRM's planning objectives for integrating transportation systems with land use and the environment.

5.2 Private Development

Describe how, or to what extent, Highway 113 is consistent with HRM's planning objectives for residential and related commercial development in suburban and urban areas, including the Blue Mountain area and communities such as Bedford West.

5.3 Parks and Natural Areas Land-use

Describe how, or to what extent, Highway 113 is consistent with HRM's planning objectives for regional parks and open space corridors in the Blue Mountain area and the vicinity of Frasers Lake.

5.4 Recreational Land-use

Describe how, or to what extent, Highway 113 is consistent with HRM's planning objectives to provide opportunities for public recreational land-use in the Blue Mountain area and the proposed Bedford West community.